The outcome of a Return to Work programme for injured workers with musculoskeletal disorders

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General Declaration

In accordance with Monash University Doctorate Regulation 17/ Doctor of Philosophy and Master of Philosophy (MPhil) regulation the following declarations are made:

I hereby declare that this thesis contains no material which has been accepted for the award of any other degree or diploma at any university or equivalent institution and that, to the best of my knowledge and belief, this thesis contains no material previously published or written by another person, except where due reference is made in the text of the thesis.

This thesis includes two original papers published in peer reviewed journals (British Journal of Occupational Therapy and Scandinavian Occupational Therapy Journal), and three unpublished (submitted to Occupational Therapy International Journal, Occupational Therapy in Health Care, and Work: A Journal of Prevention, Assessment & Rehabilitation). The core theme of the thesis is "*The outcome of a Return to Work programme for injured workers with musculoskeletal disorders."* The ideas, development and writing up of all the papers in the thesis were the principal responsibility of myself, the candidate, studying at the Department of Occupational Therapy, Monash University under the supervision of Associate Professor Louise Farnworth and Dr. Lisa O'Brien.

The inclusion of co-authors reflects the fact that the work came from active collaboration between researchers and acknowledges input into team-based research.

In the case of Chapters 3 -7, my contribution to the work involved the following:

Thesis chapter	Publication title	Publication status	Nature and extent of candidate's contribution
3	Reliability and validation properties of the Malaysian language version of the Occupational Self Assessment version 2.2 for injured workers with musculoskeletal disorders	Published	80 %- Concept development, literature review, ethics application, data collection and analysis, writing and submission of manuscript, amendments to manuscript post peer review
4	Investigating the occupational functioning, activity limitations, and participation restrictions of Malaysian workers with musculoskeletal disorders not engaged in a Return to Work program	resubmission to journal waiting final outcome	80 %- Concept development, literature review, ethics application, data collection and analysis, writing and submission of manuscript
5	Health status of people with work-related musculoskeletal disorders in return to work programs. A Malaysian study	in Press	80 %- Concept development, literature review, ethics application, data collection and analysis, writing and submission of manuscript, amendments to manuscript post peer review
6	Occupational competence and its relationship to emotional health in injured workers in return to work programmes. A Malaysian study	Published	80 %- Concept development, literature review, ethics application, data collection and analysis, writing and submission of manuscript
7	Personal experiences and expectations of support in the process of return to work from workers with work-related injuries	Under review	80 %- Concept development, literature review, ethics application, data collection and analysis, writing and submission of manuscript

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Abstract

The studies contained in this thesis investigate the impact of a return to work (RTW) programme that has been conducted by Malaysian Social Security Organisation (SOCSO). Important findings on underlying issues of occupational performance and participation, health status, and emotional wellbeing of injured workers is presented using two frameworks, the Model of Human Occupation (MOHO) and International Classification of Functioning and Disabilities (ICF), and also the different phases of RTW programme (off-work, re-entry, maintenance and advancement phases). To examine the issues, these four phases were used to explore injured workers abilities and capacities. The injured workers also were interviewed about their experiences and expectations regarding the supports that they had obtained from the stakeholders whilst involved with SOCSO's RTW programme.

The thesis is organised into the following chapters. The background of the research and appraisal of the underpinning theoretical frameworks are explained in Chapter 1. A literature review of studies regarding musculoskeletal disorders and RTW outcomes, types of interventions and instruments that have been used to study RTW are critiqued in Chapter 2. Five publications (two published and three under consideration) comprise Chapters 3 to 7. These are individual studies addressing five key research questions that arose from literature review, theoretical model and the process of RTW. A variety of methodologies have been employed to answer the research questions, including test and re-test reliability, validity analysis, cross-sectional surveys, parametric and non-parametric tests, correlation test and qualitative study (thematic analysis).

In the first study (chapter 3), we found that Malaysian language Occupation Self Assessment version 2.2 (OSAv2.2) was reliable and valid to be used to assess biospsychological factors in the Malaysian RTW programme. The Malaysian OSAv2.2 showed high overall internal consistency, with a Cronbach's alpha coefficient of 0.91. In addition, test-retest reliability (Intra-class correlation (ICC)) for all 21 items ranged from 0.41 to 0.84. In terms of convergent validity, the physical functioning subscale of the Health Surveillance Survey (SF-36v2) had a moderate and significant relationship to the OSAv2.2 competence scale (rho= 0.552, p=0.001).

In the second study (chapter 4), we found that occupational competence (mean=53.09, SD=10.38) in our sample (n=35) was found to be significantly lower than the reference population (mean=57.19, SD= 7.47, p=0.025) but there were no differences in our results based on gender, job status, or whether the person was still receiving medical treatment. Significant associations were found with most activity limitations measured by the SF-36v2, with the strongest of these occurring with the item "bending, kneeling or stooping" (rho=0.64) and "carrying groceries" (rho=0.53) ($p<0.05$). All participants rated the impact of their health problems on social activities as moderate to extreme.

In the third study (chapter 5), we found that all of the injured workers (n=102) exhibited below-average health (as measured by SF-36v2) when compared to the internationally-established normative population (mean=50.00, SD=10.00), with their physical health component summary (mean= 37.77, SD=7.69) rated lower than their mental health (mean= 38.98, SD= 11.11). Across the different groups, significant differences were found in 5 of 8 SF-36 v2 domains including role-physical, vitality, bodily pain, general health, and mental

health ($p<0.05$). The maintenance group had significant differences when compared to either the off-work or re-entry groups. However, non-significant differences emerged when comparing between off-work and re-entry groups.

In the fourth study (chapter 6), injured workers (n=78) exhibited significantly lower occupational competence (OC) (mean= 50.45 SD= 11.86) (as measured by OSAv2.2) in comparison with an international group with various disabilities (mean=57.19, SD= 7.47, $p<0.001$). In contrast, there was a significantly higher negative emotional state (NES) (mean=21.30, SD=15.99) (as measured by Depression Anxiety Stress Scale (DASS-21)) when compared with Malaysia's general population (mean=16.50, SD=9.10, $p=0.011$). Significant differences in OC and NES were also found between workers in the three RTW phases ($p<0.031$). In particular, OC and NES in the off-work and re-entry phases were significantly lower (OC) and higher (NES) than in the maintenance phase. Furthermore, there was a moderate, negative correlation between OC and NES in the off-work and re-entry phase groups. This indicated that low levels of perceived OC were associated with higher levels of NES.

In the fifth study (chapter 7), injured workers (n=21) described personal experiences and expectations of support they obtained when they were in the SOCSO's RTW programme. While participants experienced several positive supports in their RTW, they also suggested that the compensation provider, case managers, employers and health professionals provide further resources and services. These ranged from more flexibility in RTW programmes, provision of clear information and communication about requirements for injured workers to the employer and more moral and psychological support.

All provide support for the need for consideration of the injured workers health status, emotional wellbeing and occupational functioning across the off-work, re-entry, maintenance and advancement phases of the RTW programme. The final chapter (Chapter 8) provides a discussion of the significant findings in relation to the health, emotional wellbeing and occupational functioning statuses of the participants involved in this thesis. It summarises the themes that emerged from their experiences and expectations of support whilst they were in the SOCSO's RTW programme. It also includes the limitations of the study and directions for future research.

This thesis has demonstrated that, because the occupational performance and participation of injured workers with musculoskeletal disorders is impacted, return to work programmes need to address these issues, especially when workers are in the off-work and re-entry phases. In particular, health status and emotional wellbeing need to be addressed because, as shown in this body of work, these are associated with occupational performance and participation. RTW programmes must not only look at actual numbers of people who are returning to work, but also the underlying issues related to workers' interests, roles, routines, and performance or skills in daily living/work. Furthermore, the findings recommend the establishment of RTW guidelines for employers, employees and health providers. These must be produced and implemented at a national level, as per the practice in other developed countries.

These studies provide an evidence base to consider injured workers' occupational performance and participation in the process of RTW, since these are associated with overall health and mental status. The findings also provide a basis for the development of occupationally-based interventions to support RTW conducted by SOCSO especially in the

early off-work and re-entry phases. The emergent themes in terms of expectations from the injured themselves of different stakeholders can be reflected on to improve the management of SOCSO's national RTW programme.

Abbreviations

DASS-21	Depression Anxiety and Stress Scale
DOSH	Department of Occupational Safety and Health
ICF	International Classification of Functioning and Disability
MOHO	Model of Human Occupation
MSDs	Musculoskeletal Disorders
OSAv2.2	Occupational Self Assessment version 2.2
OTs	Occupational Therapists
RTW	Return to Work
SF-36v2	Health Surveillance Survey version 2
SOCSO	Social Security Organisations
WEIS	Worker Environment Impact Scale

Thesis Publications

	SCImago Journal & Country Rank (2011) Scopus	ISI Web of knowledge (2011) Thompson Reuters	Page
Murad M.S., Farnworth L., O'Brien L. (2011). Reliability and validation properties of the Malaysian language version of the Occupational Self-Assessment version 2.2 for injured workers with musculoskeletal disorders. *British Journal of Occupational Therapy, 74(5),* 226-232.	0.618	NA	78
Murad M.S., O'Brien L., Farnworth L., Chien C. Investigating the occupational functioning, activity limitations, and participation restrictions of Malaysian workers with musculoskeletal disorders not engaged in a Return to Work program. *Occupational Therapy International (under review)*	0.378	0.526	91
Murad M.S., O'Brien L., Farnworth L., Chien C. Health status of people with work-related musculoskeletal disorders in return to work programs. A Malaysian study. *Occupational Therapy in Health Care (in Press)*	0.031	NA	123
Murad M.S., O'Brien L., Farnworth L, Chien C. (2012). Occupational competence and its relationship to emotional health in injured workers in return to work programmes. A Malaysian Study. *Scandinavian Journal of Occupational Therapy,* early online, 1-10.	0.561	1.070	164
Murad M.S., Farnworth L., O'Brien L. Personal experiences and expectations of support for return to work workers with work-related injuries: An exploratory study. *Work. A Journal of Prevention, Assessment & Rehabilitation (under review)*	0.292	NA	180

Chapter 1 Introduction

In this chapter, I will explain my clinical experiences that led to my interest in exploring the issues of injured workers in RTW programmes. I will also provide the background of the Malaysia National RTW programme and outline the theoretical frameworks that underpin this research. Finally I will describe the focus for this research based on the theoretical framework and the body of research explored.

1.1 General Introduction

I have been involved in working with people with wide range of disabilities, from physical to psychosocial. My main focus of this work has been in vocational rehabilitation and return to work including functional capacity evaluation, vocational exploration, sheltered work shop employment, half-way house, job placement, and modification of accessibility to work and home environments, driving assessments, risk assessment, and so on. According to Townsend and Polatajko (2007), the roles that OTs can use to enable clients include: adaptors, advocates, coaches, consultants, coordinators, supervisors, educator and therapists. In my work related to vocational employment, I have undertaken many of these roles to ensure my clients will successfully return to work. I have been therapist, case manager, placement officer, and social worker. A consistent challenge has been to convince the employer to accept a client with disabilities, even when the person has been injured in the workplace. At one time, I have asked my client not to reveal that he had a disability so that he could get the job. I even encountered a client's death after her return to work. This occurred in the Ramadan month when an inexperienced factory manager did nothing to help her during asthma attack, something that happened regularly. The employer, rather than assisting, waited for me to get a nurse and ambulance for this emergency situation. This made

me wonder how many people with disabilities survive returning to work after injury, what legal rights they have, what should they expect of an employer, and what supports are in place for them.

A most valuable experience was when I was involved helping injured workers to return to work at Sony Industries, a large multinational company with an international reputation. I was able to apply occupational therapy skills that were needed for the RTW of six physically disabled clients including, vocational exploration, job identification, adaptation of job tasks at the workplace, modification of transportation, and home and community settlement. The General Manager of Sonī Kabushiki Gaisha (Sony) is Japanese, and experienced in working with disabled persons. The success of the Sony RTW programme was disseminated through a public forum where all the nearby industries were invited to be involved in a RTW forum, where I was the main speaker on how we return people to work successfully. I felt great satisfaction when people I worked with were still working at that place, but I was concerned when they quit or were not working anymore. This is where I questioned what it was about a RTW programme that enabled workers to stay at work or not.

I felt that I needed to acquire more knowledge and skills to support my practice. I pursued a Master in Industrial Safety Management at Malaysian's National University and after I graduated I was involved with giving consultations and workshops regarding health and safety, ergonomics and back care with workers, corporate companies, and organisations. When I obtained my scholarships for PhD study, those valuable clinical experiences made me want to choose the topic of "The outcome of a Return to Work programme for injured workers with musculoskeletal disorders" for my studies. To be able to change RTW practices

I discovered through my PhD that the bottom line of RTW is not just the actual numbers of injured workers who have returned to work; there are other underlying issues, or basic human needs, that make a RTW programme successful. Hopefully at the end this study, the findings will fill a gap in the literature regarding RTW for injured workers with musculoskeletal disorders.

1. 2 Background of this research

The aim of this research is to investigate the outcomes of the Malaysian RTW programme in relation to occupational, physical and mental functioning, and the work environment issues related to workers with musculoskeletal disorders (MSDs) across four RTW phases (off-work, re-entering to work, maintenance, and advancement) and over a period of time. Social Security Organisation (SOCSO) is an organisation in Malaysia who takes care of the welfare of the workers employed in the private sector. It is a statutory body under the Ministry of Human Resources established in January 1971 to improve social security protection through social insurance, including medical and cash benefits, provision of aids and equipment, and rehabilitation to employees to reduce the impact of the injury, and to provide financial guarantees and protection to families. The Employment Injury Insurance Scheme provides protection for workers who have had accidents that occur while travelling, arising out of, and in the course of, employment, and occupational diseases. An Invalid Pension Scheme provides protection against invalidity or death due to any cause not connected with employment. Benefits include medical, temporary and permanent disablement benefit, constant attendance allowance, dependant's benefit, funeral benefit, rehabilitation and education benefit, survivors' pension, and invalidity grant.

Workers in Malaysia are covered by the *Employment Act 1955*, the *Industrial Relations Act 1967*, the *Employees Provident Fund Act 1951*, the *Employees Social Security Act 1969* and the *Occupational Health and Safety Act 1994.*

The *Employment Act 1955* is the main legislation covering the relationship between employer and employee. The Act is applicable to all manual workers and other workers earning less than RM1500.00 (AUD $500.00) per month. The Act provides the minimum conditions of employment. Amendments to the Act in 1998 provide that all those earning below RM5000.00 (AUD $1666.67) per month can seek protection under the Act if their employers fail to adhere to the terms and conditions in the contract of service between employer and employee.

The *Industrial Relations Act 1967* covers the relationship between unionised workers and employers. Section 20 of the Act also allows for workers to seek reinstatement if unfairly dismissed. The *Occupational Health and Safety Act 1994* protects the worker against unsafe work sites and unhealthy work practices. The *Employees Provident Fund Act 1951* requires the employer and employee to contribute 12% and 11% of the employee's salary to the Employees Provident Fund.

The *Employees Social Security Act 1969* covers all workers who earn less than RM3000.00 (AUD $1000.00) per month. The Act provides for benefits and a pension if a worker is injured or disabled during working hours or while travelling to and from work. The *Employees Social Security Act 1969* was implemented in 1971 to provide protection for employees and their families against economic and social distress in situations where the employees sustain injury or death. In other words, this Act provides certain benefits

(*Employees' Social Security Act 1969*, *Section 15*) to employees in cases of invalidity and employment injury including occupational diseases. The schemes of social security under the said Act are administered by SOCSO and are financed by compulsory contributions made by the employers and the employees.

Every employer employing one or more employees as specified by the Act must register and contribute to SOCSO. In 2010 there were 769,684 employers registered (Pertubuhan Keselamatan Sosial Malaysia, 2011). Also, all employees of such industries must be insured (*Employees' Social Security Act 1969*, *Section 5*) and their industry must register with SOCSO (*Employees' Social Security Act 1969*, *Section 4*). This means that all employees under a contract of service or apprenticeship and earning less than RM 3,000 (AUD 1,000.00) per month must compulsorily register and contribute to SOCSO regardless of their employment status, (whether it is permanent, temporary or casual in nature). In 2010 there were 13,831,875 employees registered (*Employees' Social Security Act 1969*, *section 2(5)*) (Pertubuhan Keselamatan Sosial Malaysia, 2011). The exception is foreign workers who are no longer protected by SOCSO but they are protected under *Worker Compensation Act 1952*. The public sector workers have also been exempted since 1983 because they are covered by the *Pension Act 1980 (*Act 227*)* and are entitled to medical benefits under their scheme of service (*Malaysian Industrial Relations & Employment Law*, p. 74). An employee who has never been registered with, or contributed to, SOCSO, and who is earning more than RM 2,000 (AUD $666.67) per month is given an option to be covered under the Act with the agreement of his or her employer (*Guide to the Employment Act and Labour Laws of Malaysia*).

The Malaysian RTW is a rehabilitation programme that has been introduced by SOCSO for their insured workers in accordance with the Employees' Social Security Act 1969, Section 57(1). The RTW programme is open to insured workers who are involved in employment-related injuries and are receiving permanent and temporary disablement benefits and who are recommended for rehabilitation by the Medical Board, Special Medical Board or Appellate Medical Board. The research presented in this thesis was conducted in Kuala Lumpur, the capital and largest city of Malaysia (population of 1.6 million), where the management of RTW has became more established in terms of human resources and facilities.

One of the features of the RTW programme in Malaysia is access to rehabilitation services (Pertubuhan Keselamatan Sosial Malaysia, 2008). This is a physical rehabilitation programme for the insured worker who has reduced functional capacity. The primary purpose is to return the person back to his or her functional ability and former work as soon as possible. SOCSO believes that by using a case management approach where there is an appointment of a case manager for every person (case) in the programme, the RTW can be managed professionally and systematically (Pertubuhan Keselamatan Sosial Malaysia, 2008). SOCSO has appointed five case managers to implement the RTW programme using a biopsychosocial case management model which is a combined integration of biological, psychological and sociological factors (Pertubuhan Keselamatan Sosial Malaysia, 2008) .

Every case manager is responsible for the case referred from the first day until the end of the process (Pertubuhan Keselamatan Sosial Malaysia, 2008). The RTW rehabilitation programme involves different disciplines but the process is not standardised and perhaps differs from one case to another. According to Edmund Chong, case manager with the RTW unit in SOCSO (personal communication, April 2, 2009) every case entered in RTW will

undergo a process of functional capacity evaluation (FCE) that is completed at the SOCSO panel rehabilitation centres. This evaluation is normally administered by an Occupational Therapist (OT) through a set of standardised protocols and tools designed in consultation with Australia's Commonwealth Rehabilitation Services (CRS) (Commonwealth Rehabilitation Services, 2006). Three of the SOCSO case managers were also sent to CRS for training in the RTW programme.

The FCE consists of various tests including lifting, dexterity, endurance etc. There are some psycho-social elements in the FCE and it normally takes a full day to conduct a complete FCE. From the initial assessment, the case manager identifies problems faced by the insured worker and then plans rehabilitation assistance that he or she needs. The insured worker may need rehabilitation services such as counselling, psychological assistance, work assessment. The purpose of the rehabilitation programme process is to identify long-term vocational goals, and develop skills to either search for a new job or return to work with the assistance of a suitable rehabilitation programme (Pertubuhan Keselamatan Sosial Malaysia, 2008).

The case managers are also given the responsibility of exploring issues in-depth with the injured workers, and educating them, to enable them to have the best form of social security, which is through employment. In most cases, the injured worker will agree to participate in a RTW programme. Workers who do not agree to participate are classified by SOCSO as 'unmotivated'. The reasons workers are classified as unmotivated are multi-factorial. It could be related to a number of personal reasons such as financial burdens, psychological and social issues, or an "uncooperative" attitude during the assessment process. Currently, those who are classified as unmotivated workers are advised that the RTW is always open to them should they need to return to work guidance. Normally, the case manager can only advise

them to seek other professional assistance if there is a need. For example, if person with an amputation does not want to return to work, SOCSO will still assist him in terms of a referral for prosthetics and orthotics.

The SOCSO Panel Rehabilitation Centres that are involved with RTW programme include the following (Pertubuhan Keselamatan Sosial Malaysia, 2008):

Rehabilitation Centre, Kuala Lumpur General Hospital

Rehabilitation Centre, Tuanku Jaafar Selayang Hospital

Rehabilitation Centre, University Malaya Medical Centre

Optometry Rehabilitation Centre, University National Medical Centre

Pain Management Clinic, Selayang Hospital

DBC Spine and Rehabilitation Centre, Kuala Lumpur

Blind Association Malaysia, Tun Sambathan Road, Kuala Lumpur

Hand and Microsurgery Department, Selayang Hospital

Hand and Microsurgery Department, Pantai Medical Centre

Sau Seng Lim Rehabilitation Centre, Puchong

The RTW programme was introduced in 2007. Since its establishment and up until 2008 when this research commenced, 328 cases have been referred for the RTW programme. From the annual report of SOCSO, the breakdown of cases for the different phases are: return to work, 166 cases (63.8 %); rehabilitation, 74 cases (28. 4 %); and treatment, 20 cases (7.8 %). The RTW programme can be conducted at the former work place or a new work place of the injured worker. In year 2010, 1,640 cases were referred to this programme and only 1,004

cases (61 %) had returned to work. Insured workers participating in RTW programme showed improvement in their capabilities in terms of skills, career direction, independence, self-esteem, self-confidence, health condition, and tolerance to pain after going through full physical and vocational rehabilitation through the RTW programme (Pertubuhan Keselamatan Sosial Malaysia, 2011).

The RTW programme for workers with musculoskeletal disorders (MSDs) involves a long process. It encompasses four stages outlined by Young et al. (2005), which include not only the off-work phase but also the work place re-entry, maintenance, and advancement phases. These will be explained in more detail later. The underpinning issues from the worker's perspective will be therefore explored at each of these different phases.

In addressing the issues, two models will be appraised in relation to the personal and environmental context of the workers. The pattern of the workers' occupational functioning in terms of competency and values, physical and mental health functioning, and environmental issues at different phases will be explored and evaluated. This aims to enable the case managers and therapists to provide more efficient and quality services for the injured workers.

As will be discussed in the review of the literature, there are no published studies regarding RTW programmes from a Malaysian perspective, although there is an abundance of literature from countries such as Sweden and Canada (Bengt et al.,2003; Lotters, Hogg-Johnson, & Burdoff, 2005; Westman et al.,2006). Although there are several studies on physical and mental health functioning, including the quality of life of workers with MSDs, the occupational functioning and environmental issues from the perspective of workers at different phases of the RTW programme has not been the focus of research to date. Also, there is a lack of long-term follow-up studies on the outcomes of such multidisciplinary

rehabilitation programmes, therefore, their effectiveness is unknown (Karjalainen et al., 2003a; Karjalainen et al., 2003b, 2009).

1.3 Conceptual framework of the thesis

Workers with MSDs having long term issues have been reported to be the second most common patient group within the primary health care and the RTW programme after illness or injury, especially since MSDs are often very complex (Schmidt et al.,2008; Schultz et al.,2005; Sjostrom, Alricsson, & Asplund, 2008). The study of this process is often fragmented and non-theoretical (Shaw & Polatjko, 2002). This thesis aims to investigate the outcome of the RTW programme phases using two key theoretical models.

1.3.1 Biopsychosocial model

The biopsychosocial model involving multidisciplinary rehabilitation programmes has been created to facilitate the return of the injured worker to an active and independent life (Grahn, Ekdahl, & Borgquist, 2000). Engel (1980) formulated the biopsychosocial model as a dynamic, interactional, but dualistic view of human experience in which there is mutual influence of mind and body. It is a philosophy of clinical care and practical guidelines. It is a way of understanding how the impact of diseases and illness are affected by multiple levels of the organization, from the societal to the molecular level (Francesc, Anthony, & Ronald, 2004). Francesc et al. (2004) add to the model the need to balance a circular model of causality with the need to make an accurate approach, especially in the planning of the individual treatments. Based on this premise, there is also the need to change the clinician's stance from objective detachment to reflective participation, thus infusing care of the person,

such as those with MSDs as a consequence of a work related injury, with greater warmth and caring in the process. As the SOCSO RTW programme is based on this model, it is necessary to understand the RTW outcome from the injured worker's perspective undertaken in this study. Therefore, qualitative interviews have been incorporated into the research design to understand and describe the experiences of injured worker with MSDs in relation to physical and socio-cultural environmental factors.

1.3.2 The International Classification of Functioning disability and health model (ICF)

In this thesis, to address a multitude of questions in a coherent manner in terms of thinking about the worker's physical performance problems and understanding the worker's perspective, the World Health Organisation's (WHO) International Classification of Functioning Disability and Health (ICF) will be used as the key model or conceptual framework (WHO, 2001). The ICF has been developed to define disability and function (WHO, 2001) as shown in Figure 1.

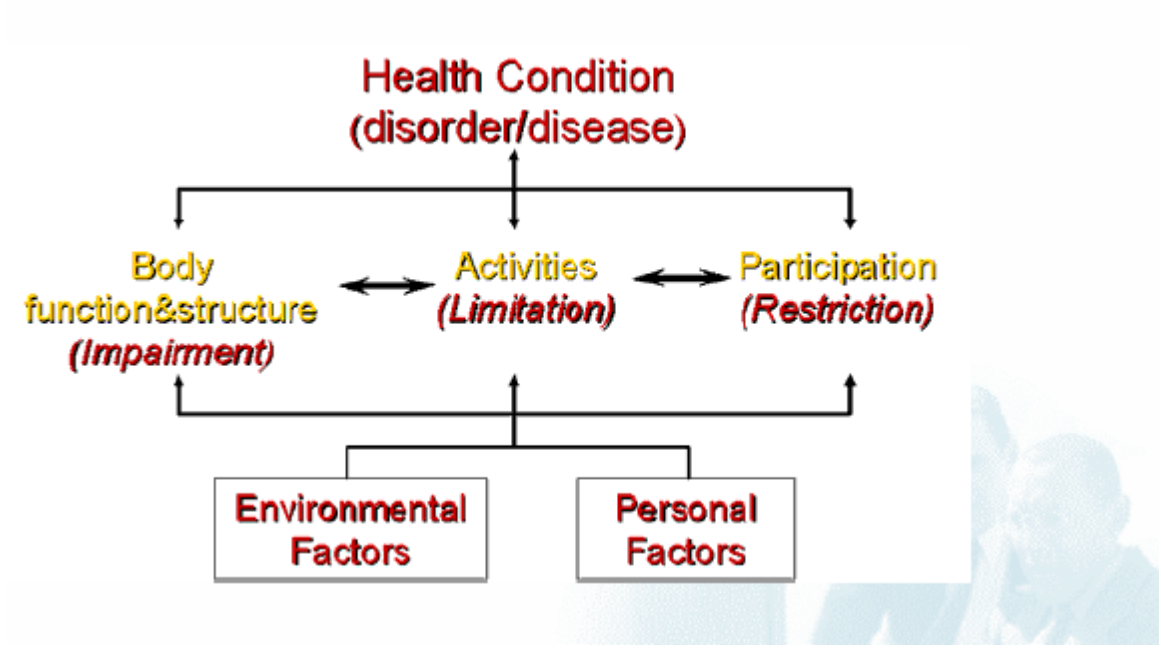

Figure 1: International Classification of Functioning, Disability, and Health (ICF) (WHO, 2001).

According to the ICF, a person's level of function is complex, with multiple determinants having effects at many levels and involving multiple dimensions. It has universal and clear terminology with quantifiable assessment measures that are highly relevant for the RTW process. The ICF is a significant change from the medical and physician oriented models to the rehabilitation, and patient-oriented models of evaluation function, disability, and health status. Human functioning is not determined by the disability alone. It involves many factors, including body function and structure, activities, and participation, in a broader-based concept that many health professionals can understand and apply (Walsh, 2004).

The ICF provides a description of situations with regard to human functioning and serves as a framework to organize this information. A schematic representation of the ICF is shown in Figure 1.The classification is organized into two main parts - part one concerning functioning and disability, the second covering conceptual factors. Part one is further subdivided into health condition, body function and structures, activities and participation. Impairment refers to problems with body functions and structures. Activities and participation refer to the execution of a task by the individual and involvement in life situations.

Part one - functioning and disability are concepts that should be applicable across different cultures, whereas part 2 - contextual factors - should be seen in the context of an individual's life, living and culture and includes two further components - environmental factors and personal factors. The above model can be used to describe the process of interaction by mapping different components, and forms a useful structure to construct research questions. Furthermore, the interaction between the components is important, as it demonstrates that the

provision of healthcare (in this case) is not static, but open to change, interaction and evolution.

1.3.3 The Model of Human Occupation (MOHO)

MOHO was published in the 1980's, and the model has gone through four major revisions (Kielhofner, 1985, 1995, 2002, 2008). In this thesis, to address the issues concerning how well and how important it is for the workers with MSDs to be able to function in relation to their basic tasks of living as well as managing life and relationships, their satisfaction, enjoyment and actualisation, questionnaires directed at the injured workers have been constructed based on the MOHO (Kielhofner, 2008). The responses from the injured workers facilitated the measurement of aspects of the worker's occupational adaptation. They provided an indication, in the process, of the impact of health condition as the worker's performance of daily functions.

The MOHO model is able to explore in detail how personal and environmental factors can influence a worker's competence in relation to his or level of functioning in each RTW phase. The success or failure of the RTW programme depends not only on the efficient services of the case managers or therapists that are involved in the RTW programme, but also on the personal and environmental factors of the injured worker.

The MOHO understands personal factors of the individual as three factors that inter-relate with each other. The magnitude of the personal factors will reflect the individual's competence in his or her basic tasks of living, and managing life and relationships, as well as the individual satisfaction, enjoyment and actualisation (Kielhofner, 2008). According to Kielhofner (2008) , three personal factors are volition, habituation and performance capacity.

> Kielhofner (2008) states that "Volition refers to the motivation for occupation. Habituation refers to the process by which occupation is organized into patterns or routines. Performance capacity refers to the physical and mental abilities that underlie skilled occupational performance (p.12)".

It is important to measure the worker‘s point of view regarding how he or she is coping with the disability during the RTW phases as none of previous studies have done this. This research aims to enlighten case managers and therapists regarding which best practice strategies need to be employed in each phase of the RTW programme so that the injured workers are able to retain or improve their issues related to personal factors, such as volition, habituation and performance capacity. This has been done through a cross-sectional survey in this study with injured workers attended SOCSO RTW programme which is presented in Chapter 5 and 6 (Murad, O'Brien, Farnworth, & Chen, Submitted-b; Murad, O'Brien, Farnworth, & Chien, 2012).

Environmental factors will also be a key focus in this thesis. Kielhofner (2008) stated that, "Occupation is always located in, influenced, and given meaning by its physical and socio-cultural context (p.21)." Therefore MOHO addresses the role of physical and socio-cultural environments in influencing personal factors and in this study, how these impacted on the RTW. According to Kielhofner (2008), the physical dimension of the environment includes both space and objects. As MSDs are often the consequence of the nature of a worker's physical environment, it is important to understand the issues of the physical dimension that affect the RTW programme, for example, modification of the types of equipment, working conditions, and job tasks.

According to Kielhofner (2008) the social dimension includes the occupational forms (types of occupations) that persons perform and the social groups in which they interact in the performance of these occupations. In this study, the socio-cultural environment refers to interactions that the injured workers are involved with, especially during medical and rehabilitation sessions, for example his or her interactions with the case manager (SOCSO), the therapist, and family. Furthermore, during his or her returning to the work place especially during the re-entry phases of RTW, there will be difficulties the worker faces in relationship to the social environment that impact on adjusting to his or physical and mental performance, for example, interaction with peers, supervisors and employers. This has been done through exploratory study by interviewing the injured workers attended SOCSO RTW programme presented in Chapter 7 (Murad, Farnworth & O'Brien, submitted).

A review of 44 studies related to predictable factors in RTW by Braveman (1999) found that the factors most often shown to have predictive power could be organised to the MOHO personal factors of volition, habituation and performance capacity. Additionally, the MOHO can be utilized alongside the biomechanical model. This is presented in a case study by Baron and Littleton (1999) which discussed the application of the MOHO and the biomechanical model in the treatment of a patient with a hand injury, who could not work (K. B. Baron & Littleton, 1999). The study illustrates how the MOHO assessments could be used to frame the client's intervention. By combining the two models, the authors conclude that a more holistic and effective approach to treatment was developed.

Kramer, Bowyer and Kielhofner (2008) have written about several similarities between the MOHO and ICF models. They argue that

> "the MOHO concept 'volition' is aligned with the ICF category motivation under the ICF domain of mental functioning. MOHO's concept of occupational performance is broadly similar to the ICF domain major life area, as they both refer to carrying out tasks associated with major life roles such as work and education. Occupational performance in terms of occupational participation, competence, and identity reflects aspects of every category in the ICF domain of major life area. MOHO's concept of social groups was aligned with the ICF domain attitudes in that social group" (p.520).

MOHO is not perfectly aligned with ICF because the frameworks branch from different theoretical backgrounds (Stuki et al., 2002). MOHO is an occupational therapy-based practice model, concerned with people's participation in culturally and personally relevant occupations. Conversely, the ICF attempts to classify function in relation to health branching from a biopsychosocial standpoint that seeks to understand the effect of disease on function. The most distinguishing difference between these two theoretical backgrounds is MOHO's concern with the direct experience of the person, and the acknowledgment of the person behind of his or her own occupational narratives. The ICF only studies the effects of illness or disability, experienced for example by an injured worker, without attempting to understand how he or she copes with the effects in the areas of liability and independence (Hemmingsson & Jonsson, 2005). The discussion on the difference between MOHO and ICF is independent of injured workers but then can be applied to illustrate the experience they are facing during the process of returning to work that has been undertaken in the manuscript presented in Chapter 5 and 6 (Murad, O'Brien, Farnworth, & Chen, Submitted-a; Murad et al., 2012) .

Throughout MOHO's development, over 20 assessment tools have been developed for practice and research purposes. A review by Lee and Kielhofner (2009) of 45 published work-related interventions specifically related to an occupation-focused theory (MOHO)

indicate that MOHO-based work assessments have good psychometric properties and are useful in evaluating vocational potential with a range of clients. These assessments include:

- Worker Role Interview (Braveman et al., 2005)
- Work Environment Impact Scale (Corner, Kielhofner, & Olson, 1998)
- Dialogue about Ability Related to Work (Norrby & Linddahl, 2006)
- Assessment of Work Performance (AWP) (Sandqvist, Tornquist, & Henriksson, 2006)

Worker Role Interview (WRI)

WRI is a semi-structured interview and rating scale that assesses the impact of personal causation, values, interests, roles, habits, and perception of the environmental on potential for obtaining or returning to work. WRI is suitable for clients' having physical or mental disabilities, including those with longstanding illness or disability.

Work Environment Impact Scale (WEIS)

WEIS is a semi-structured interview and rating scale. WEIS assesses features in the work environment that support or impede performance, satisfaction and well-being. WEIS also was used to identify needed workplace accommodations. WEIS detect Clients who has experiencing difficulty on the job whose work is interrupted by an injury or illness.

Dialogue about Ability Related to Work (DOA)

DOA is a client self-assessment and professional observation. DOA assesses influence of volition, roles, physical ability, and communication and interaction skills work ability. DOA limited to clients with psychiatric and psychosocial problems

Assessment of Work Performance (AWP)

AWP is an observation-based performance rating scale. AWP assesses motor, process, and communication and interaction skills within a work activity. AWP designed for any client experiencing a work-related problem.

None of the instruments above have been used with workers with MSDs who are attending the SOCSO's RTW programme although the instruments have proven their sensitivity, reliability, and validity for a wide range of disabilities (Taylor et al., 2009). All of these instruments (except the DOA) need qualified therapists to do face-to-face interviews and observation, and due to limited time and logistic reasons (all the participants were located throughout the country) we unable to use them in our research. Also, some instruments have been designed only to assess injured workers who have returned to work (for example AWP (Sandqvist et al., 2006)) and this did not fit with our sample.

One of the MOHO assessments was, however, chosen for the study presented in Chapter 3 is the Occupational Self Assessment (OSA) version 2.2 (K. Baron, Kielhofner, Iyenger, Goldhammer, & Wolenski, 2006). The reason OSAv2.2 was chosen is that, it is self-report assessment and able to detect the full range of injured workers' ability and capacity, and was broadly applicable to participants in our study who ranged from off-work, re-entry, maintenance and advancement phases (Young et al., 2005). OSAv2.2 has undergone several studies to measure its psychometric properties in terms of sensibility, reliability and validity (K. Baron et al., 2006). Most recently Kielhofner, Forsyth, Kramer and Iyenger (2009) used a Rasch measurement (Item response theory) that showed that the 21 items of the OSAv2.2 and their different combinations have good internal validity and are able to measure the unidimensional constructs of Occupational Competence and Value. The four-point rating scale provided more detailed with an accuracy of 90 % regarding the range of disabilities

from a variety of contexts (geographical and practice). Ninety per cent accuracy was based on participants use a self-report assessment in a reliable way with minimal guidance. This achieves a balance between reliable measurement and clinical utility.

There are not many issues regarding the cultural relevance of MOHO-based assessments in the Malaysian context because the components of the MOHO itself are interrelated with each other. One of the MOHO components that addresses culture relevant to the local context is the environment. In addition, some MOHO-based assessments, such as Occupational Self Assessment (OSAv2.2), have been developed by considering Asian populations such as Japan (Kielhofner, 2009, 2010).

At the time of commencing this research, the OSAv2.2 had not been translated into or validated in the Malay language (although it has been translated into several other languages including Arabic, Chinese, Danish, Dutch, Finnish, French, German, Icelandic, Japanese, Persian, Portuguese, Slovenian, Spanish and Swedish) (MOHO Clearinghouse, 2012). For that purpose translation and validation of OSAv2.2 from English language to Malay language was undertaken as part of this body of research (see Chapter 3) (Murad, Farnworth, & O'Brien, 2011).

In conclusion, the MOHO model can be used to explore occupational functioning among injured workers with MSDs at different phases of the RTW programme by highlighting the underpinning issues that relate to volition, habituation, occupational performance as well as the physical and social-cultural environment from the perspective of the injured workers.

1.3.4. The four phases of the RTW model

One way of thinking about framing the issues for future research was developed conceptually by Young et al. (2005) who defined RTW by describing it terms into four key phases which are illustrated in Figure 2 and will be discussed in detail. The conceptual framework based on different phases was developed due to limitations in understanding and improvement of RTW outcomes (Young et al., 2005).

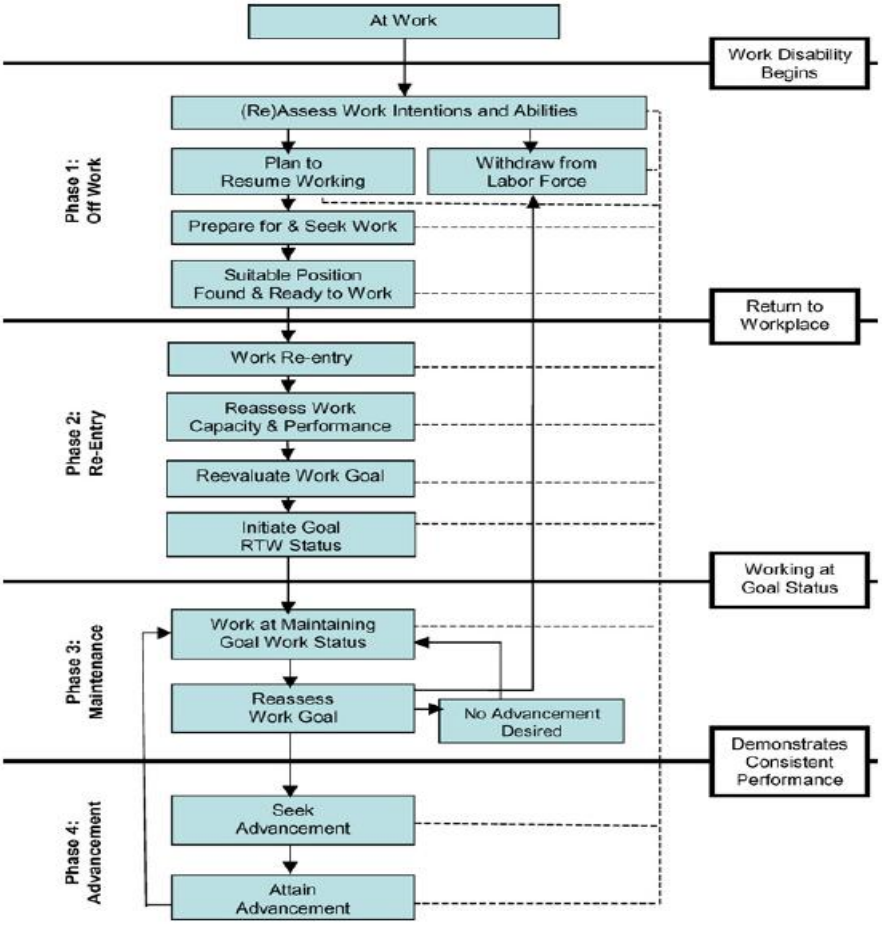

Figure 2: The four phases of RTW (Young et al., 2005)

Note. From "A developmental conceptualization of return to work," by Young et al., 2005, Occupational Rehabilitation Journal, 4, p. 561. Reprinted with permission.

Phase 1 – Off work

In this phase, the worker with a MSD is in his or her acute stage of the recovering process under a strict regimen of treatment and rehabilitation. The worker in this phase needs to have his or personal and environmental issues explored especially in relation to prevalence of the impairments, activity limitations, and participation restrictions. Furthermore, it is important to investigate how he or she is able to adapt to or cope with the basic tasks of living as well as managing life and relationships with family and community integration. It is also important to investigate the extent of the impairments and their effects on the individual's occupational functional strategy.

> Young et al. (2005) stated that when "this phase begins the first day the worker is off work due to his/her condition. At no time during this phase is the worker back at work, either in his or her pre-injury or alternative capacity; however, it should be noted that the worker may not be work disabled for this entire phase as there may be other reasons why work re-entry is delayed (e.g., retraining or the lack of a suitable position) or not pursued (e.g., early retirement). The off work phase concludes when a suitable RTW option is available and the worker is about to attempt work re-entry" (p.560)

Workers in this phase will only progress to the next phase when key outcomes are achieved in the following areas: functional abilities (especially performing his or her basic tasks at his or her work place) employment seeking behaviours (especially when he or she is unable to return to his or her former work place) and motivation (especially where his or her injuries have affected his or her psychological state) (Young et al., 2005).

Phase 2 – Re-entry

In this second phase, the worker further faces barriers due to overwhelming expectations from peers, supervisor, and the employer about what he or she can do. Issues concerning

environmental adaptation in relation to the physical and socio-cultural dimensions will be paramount, and will usually involve a number of actions in resolving the barriers faced by the worker. Indeed, how the worker adapts to, or copes with, the basic tasks of living, as well as managing life and relationships with family and community, are still the major concern, because he or she is usually still in the disability stage.

> Young et al. (2005) stated that "in this phase, the worker recommences work at either his or her pre-injury workplace, or at some alternative worksite, and stakeholders go through the process of determining if, and how, work can be undertaken in a way that is satisfactory to all parties. During this phase, performance will likely be monitored and the RTW goal may be reassessed. This phase incorporates adapting to the work role and concludes when the worker begins working at goal RTW status" (p.560).

The success of this phase depends upon establishing a good match between the workers' capabilities and job requirements, especially in regard to his or her physical and mental functioning (Buys & Renne, 2001). If such a match is not established, the employee may be unable to progress to the RTW phase. The outcomes likely to be important during the work re-entry phase include job performance (for example, achieving a basic level of productivity) recurrence of the injury (affecting the performance of basic tasks, or he or she is still in a state of fear of recurrent injuries) the expectations of co-workers, and the quality of supervisor interaction (Young et al., 2005).

Phase 3 – Maintenance

In this third phase, the major concerns are regarding how the worker is able to adapt to and cope with his or her occupational functioning in relationship to satisfaction, enjoyment and

actualisation in performing his or her daily routines or the role as a worker. In other words, the question is whether the worker enjoys and feels satisfied with the environment that has now been adapted for him or her, or support from peers, supervisor and employer at the work place. Concerns include other under pinning issues that arise during this phase.

> Young et al. (2005) stated that "during this phase, the worker strives to maintain the goal status of his or her physical and mental functioning and may consider his or her desires for advancement. This phase ends when the worker decides to pursue advancement. The success depends on the workers' capacity to settle into the job. The outcome is the worker's ability to perform duties satisfactorily, their psychological integration into the workplace, capacity to achieve goal productivity levels over the long term, and demonstrate their potential for advancement (p.560)" (Young et al., 2005).

Phase 4 – Advancement

In this fourth phase, the task is to investigate whether the injured worker enjoys or is satisfied with his or her own career pathway. In the RTW programme, it is paramount that the case managers (SOCSO) and therapists do not see just the worker's previous capacity and, as a result, limit them only to their previous level of functions and expectation. Instead, they should explore in depth the worker's current capacity and capabilities in regards to his or her career advancement in terms of development promotion and remuneration.

> Young et al. (2005) stated that "during this phase, the worker seeks advancement, may qualify for higher-level job tasks; given more responsibilities; and attains promotion. The individual may seek employment options external to his/her initial

post-injury employer, and may even return to being "off work" (i.e., Phase 1) to gain qualifications needed for advancement" (p. 560).

In this phase usually the employers and employees attempt to mutually work out improvements in the worker's responsibility and remuneration levels, completion of continuing education and career development programs, and presence of short and long-term career goals (Ahlgren & Hammarstrom, 1999; Young et al., 2005).

In this model, the end of each RTW phase marks the achievement of important RTW outcomes; the ability to attempt work re-entry, ability to perform satisfactorily, ability to maintain employment; and ability to advance in one's career (Young et al., 2005). Therefore, it is important to explore not only the physical and mental functioning status of the worker at each phase but also occupational competence and value in terms of the basic tasks of living as well as managing life and relationships and satisfaction, enjoyment and actualisation. An exploration of all the above issues is presented in Chapter 4, 5 and 6 (Murad et al., Submitted-a, Submitted-b; Murad et al., 2012). Furthermore, the work environment issues at each phase of the RTW programme needs to be highlighted for the main stakeholders to re-consider their strategies for betterment of their services which was also is presented in chapter 7 (Murad & Farnworth, submitted). The phases of the RTW programme shown in Figure 3, and the studies related to each stage will be discussed in the literature review.

1.3.5. Summary

In this study, a combination of both the MOHO and ICF models will be used to investigate the outcome of the RTW programme conducted by SOCSO. The questionnaires that have been constructed to complement the MOHO or the ICF models will become the outcome

measures for the investigation. Conventionally, the outcome measures for vocational rehabilitation have included work- disability duration (assessed by administrative data or the self-report for the time that worker is absent from work) and the overall RTW success rate (Reene-Louise Franche et al., 2005). One of the factors limiting the understanding of RTW following work disability is that these measurements do not illustrate a comprehensive picture of the workers' RTW experiences (Wasiak et al., 2007).

The factors that drive RTW outcomes can be categorised as either 'environmental' or 'personal' (Wasiak, Pransky, & Webster, 2003). The environmental factors identified include RTW related physical, socioeconomic, and attitudinal data external to the injured worker. Personal factors include details on the injured worker's personal and non-behavioural contextual RTW experience (by and large focusing on worker's cognitions and emotions) (Wasiak et al., 2003).

The MOHO model fulfils the criteria suggested by Wasiak et al. (2007) as the model studies occupational behaviour of the individual in relation to personal and environmental contexts. In conclusion, throughout this thesis MOHO has been used to describe and explain how occupational adaptation occurs in relation to the personal context of volition, habituation, and performance capacity, and to the environment contexts (both physical and socio-cultural). The ICF has been used to describe the effects of physical and mental health, and emotional well-being on participation. Psychometrically based research instruments that compliment the MOHO and the ICF models have been used to interpret those variables within the context of the four phases of the RTW programme.

The format of the literature review (Chapter 2) follows the basic structure of the ICF. It will first discuss impairment of body functions and structure in MSDs, then limitation of activities and participation restrictions due to MSDs. This will be followed by exploration of

environmental and personal factors relevant to RTW, and a discussion of the evidence for different types of RTW programmes. In conclusion it summarises of all the issues and outlines the format of the thesis.

Chapter 2 Literature review

This chapter summarises the evidence available on MSDs and RTW programme. The format of this literature review follows the basic structure of the ICF:

- Impairment of body functions and structure in MSDs
- Activity limitations and participation restrictions due to MSDs, and
- Exploration of the context of environmental and personal factors

It will also include:

- A discussion on various types of previous studies of the RTW programme
- A summary of all the issues as a conclusion to the review.

Over the past four years a series of searches of electronic databases including AMED: allied and complementary medicine, OT seeker, CINAHL, Cochrane library, Ovid Medline and ProQuest Health and Medical Complete have been conducted using a combination of the search terms “musculoskeletal disorders”, “return to work”, “multidisciplinary”, “support” “management” and “biopsychosocial”. The most recent search was conducted in May 2012.

Relevant reports published by government and community service organisations were located through a combination of Internet searches using “Return to Work” and “Musculoskeletal disorders ” and reviewing the reference lists of relevant literature found. Two hundred and six relevant articles and documents were reviewed.

2.1 Musculoskeletal Disorders (MSDs)

2.1.1 Studies focusing on body functions and structure impairment in MSDs

It is important to understand exactly what is meant by a MSD and how such the disorders are likely to be related to the personal and work environment factors. Typically, MSDs affect the

back, neck, shoulders and upper limbs; less often they affect the lower limbs. The International Classification of Diseases (ICD10) classified MSDs under Chapter XIII M99 Biomechanical lesions which are not classified elsewhere for health management purposes and clinical use (World Health Organization, 2010). The following supplementary sub-classification is used to indicate that the site of lesions is provided for optional use with appropriate subcategories in M99 (0 Head region , 1 Cervical region, 2 Thoracic region , 3 Lumbar region, 4 Sacral region, 5 Pelvic region, 6 Lower extremity, 7 Upper extremity, 8 Rib cage, and 9 Abdomen and 10 other). The Federal Bureau of Labour Statistics (BLS), USA and Manual Handling Guideline , WorkSafe ,Victoria Australia have defined musculoskeletal disorders (MSDs) as injuries and disorders to muscles, nerves, tendons, ligaments, joints, cartilage, and spinal discs (Victorian WorkCover Authority, July, 2010, June, 2005).

Most work-related MSDs develop over time and are caused either by the work itself or by the employees' working environment (Jonsson, 2000). An example of work related causes are repetitive motions, forceful exertions such as pushing and pulling, exposure to vibration, and awkward postures (Aas et al., 2011; Fagarasanu & Kumar, 2006; Jabar, 2005; Kuiper, Burdorf, & Verbeek, 1999; Martimo et al., 2009; Mohd Nizam & Rampal, 2005). The working environment also includes issues such as static standing and sitting for prolonged durations, reduction of light intensity, manual handling of loads, work organization and hand tools used (Fagarasanu & Kumar, 2006; Jabar, 2005; Jonsson, 2000; Martimo et al., 2009; Mohd Nizam & Rampal, 2005). MSDs can also result from injuries sustained in a workplace-related accident.

Pain in the low back and neck is common. An evidence based review by Jonsson (2000) of more details reported that low back pain affects up to 80 % of all people at some time during their life, and neck pain affects up to 50 % of the population of Swedish workers. MSDs can affect the body's muscles, joints, tendons, ligaments and nerves.

Back pain and its consequences are not isolated physical problems but are often associated with other secondary conditions such as social, psychological, and workplace-related issues (Jabar, 2005; Mohd Nizam & Rampal, 2005; Schmidt et al., 2008; M. Sullivan, Feuerstein, Gatchel, Linton, & Pransky, 2005). Stress, worry, and anxiety can have a decisive impact on the transition from acute to more chronic pain (C. C. Engel, Von Korff, & Katon, 1996; Renée-Louise Franche & Krause, 2005; Jonsson, 2000) and those factors should be considered an integral part of back pain in relation to preventive efforts during rehabilitation and return to work (Jonsson, 2000). For example, Jonsson (2000) recommended different strategies, such as pain management, that need to be undertaken when injured workers return to work. It is important that the psychological issues of workers with MSDs are addressed rather than only focusing on improvements in physical capacity especially as the development of anxiety, stress, and depression following a work-related injury may delay physical recovery and the return of normal functioning (M. Sullivan et al., 2005). Sullivan et al. (2005) systematically reviewed studies that related to psychosocial risk factors for pain and disability. They found that to be effective in prevention of work disability, research is required to develop cost-effective approaches targeting both worker-related and workplace psychosocial risk factors.

A cross-sectional study by Alexander et al. (2007) with 42 worker claimants with back pain at a rehabilitation facility in Alberta, Canada showed that there is a relationship between functional self-efficacy and functional capacity evaluation where functional self-efficacy beliefs influence the functional capacity performance. Injured workers completed a measure of functional self-efficacy related specifically to functional capacity performance in terms of lifting from floor-to-waist, waist-to-overhead, and horizontal lift. By using multivariate analysis, they found that higher functional self-efficacy was highly associated with better functional capacity evaluation performance (r=0.50 – 0.73) (Alexander et al., 2007). They concluded that strategies for altering functional self-efficacy beliefs and their resulting impact on patient functional performance and outcomes should be examined.

A study by Soares and Grossi (2000) regarding the relationship between levels of self-esteem (SE), clinical variables, anxiety/depression and coping with pain among patients with MSDs. In this study, cross-sectional data were collected through a questionnaire with 651 patients (72 % female, 28 % male) seeking care from general practitioners for musculoskeletal pain at rehabilitation clinics in Scandinavia. A hierarchical regression analysis shows that SE was lower among female patients compared to males. Furthermore, SE was negatively associated with anxiety/depression, but positively associated with pain intensity and active coping. This indicates that the relationship between self-esteem and pain intensity seems to be influenced by levels of emotional distress. Soares and Grossi concluded that SE is related to female gender, anxiety/depression, pain intensity and coping style in patients with MSDs (Soares & Grossi, 2000). Therefore this indicates that gender is an important factor to consider in dealing with psychological issue that arising from MSDs.

Heuvel, Ijmker, Blatter and Korte (2007) conducted a cross-sectional study with 654 workers with neck/shoulder and hand/arm symptoms who worked with computers at five different companies in the Netherlands. Of all the cases reporting symptoms, 26% had a productivity loss involved and 36% of the cases reported having both neck/shoulder and hand/arm symptoms together simultaneously. Multivariate analysis showed productivity loss had statistically significant associations with the following variables, presented as odds ratios and confidence intervals: pain intensity [1.26 (CI: 1.12–1.41)]; high effort/no low reward [2.26 (CI: 1.24–4.12)] high effort/low reward [1.95 (CI: 1.09–3.50)] and low job satisfaction [3.10 (CI: 1.44–6.67)]. In contrast, physical activity in leisure time, full-time work and over commitment were not associated with productivity loss. In fact, most of the productivity loss of computer workers with neck/shoulder symptoms or hand/arm symptoms was derived from a decreased performance at work and not from absence due to sickness (Heuvel et al., 2007). The authors concluded that favourable psychological work characteristics needed to be looked at to prevent productivity loss in symptomatic workers.

In summary, the above studies indicate that pain and psychological issues such as anxiety, stress, and depression need to be taken into consideration for the overall health outcome variables in this study. Pain and psychological issues correlate with each other and they affect the way workers with MSDs cope with their own level of occupational performance and productivity. Additionally, personal factors, such gender and coping style, need to be taken into consideration.

2.1.2 Studies on activities and participation restriction due to MSDs

Previous studies have shown that the impact of MSDs is not restricted to pain and psychological issues, but also limitations in activities and participation restriction (Agnes, Enrique, John, & Greet, 2007; Jansson & Bjorklund, 2007). The limitation of activities

depends on the site of the MSDs. For example, if the location is at the back, the limitation of the activities includes manual lifting, carrying, bending, pulling and pushing (Agnes et al.,2007). Kuiper et al. (1999) reviewed studies on the prevalence of back disorders. The results were expressed as odds ratios, and the relevant studies were divided into four categories of lifting, carrying, pushing/pulling, and combined manual material handling. A significant risk estimate greater than or equal to 2.0 was considered to be indicative of a strong association. Sixteen studies on exposure to lifting and the occurrence of back disorders were reviewed and they found that patient handling among nurses was associated with back disorders five times out of eight, and there was a strong association between daily lifting and back pain (OR: 1.3 – 4.2).

Two studies on carrying critiqued by Kuiper et al. (1999) were reviewed and they found that carrying loads was not associated with the yearly incidence of back pain in French commercial travellers, where the incidence was 13 % per year (OR: 0.9). In contrast, a study indicated that carrying more than 11.3 kilograms and 25 times per day was associated with a high risk of acute prolapsed lumbar intervertebral disc (OR: 2.7). A case study on pushing and pulling revealed that the pulling was a higher risk than pushing, where the odd ratio for the pulling was just above one (OR: 1.07 – 1.08). Nine studies for combined manual handling showed that there is a positive association for transferring patients between bed and chair (OR: 1.1 – 3.1) and for moving around patients on the bed with incidence of back pain (OR: 1.29 – 1.45). Furthermore, there was a positive association for exposure to pushing and pulling combined with lifting and a one-year incidence of back pain (OR: 1.88 – 3.07), whereas, years of exposure to handling materials of more than 2.7 kg per hand was not significantly associated with the 12 month prevalence in an aluminium smelter working environment (OR:0.24). Thus, Kuiper et al. (1999) recommended that manual handling needs

to be considered as one part of education training for people with back disorders, and at the same time, prevention methods needed to be established in the manual handling guidelines.

Jansson and Bjorklund (2007) studied the experiences of returning to work with former unemployed injured absentees from to an environmental perspective in Sweden. Five separate focus-group interviews were carried out with themes concerning workers in different environmental areas. Sixteen people were divided into four groups from a medium-sized town and one group from a small town. The participants were persons who had participated in the Forsakringskassan and Arbetsformedlingen vocational rehabilitation (FAR) project that was initiated by the Swedish Government in 2001, to support and facilitate unemployed sick listed individuals back into work. The participants had different causes of illness such as psychiatric, physical, somatic, allergic and hypersensitivity and came from different educational levels. The finding showed that off-work participants who were attempting to return to work experienced a negative self-image, change in life rhythm and restrictions in their roles and activities (Jansson & Bjorklund, 2007). The participants experienced a changed self-image while they were on long-term sick leave and unemployed. Some stated that it was hard to drop the old self-image, so they kept a facade as if everything was as before. They felt the expectations from the physical environment in relation to their performance capacity would be the same as it was before the injury, and they tended to become isolated from the work environment. The isolation could last for long periods and most of the participants felt they needed support to break it. Because of the prolonged break from performing normal routines due to their illness or injury, some participants had difficulty adjusting to a less active role, and the lack of maintaining habits and routines made it difficult to get anything done at all, thus affecting their life in general. In addition, due to the limitation of their performance capacity, some tasks that were more demanding were

dropped, which further restricted their everyday living. In the end, the choices they were forced to make were expressed as losses, as they no longer could do the things they liked to do and were interested in. The secondary psychological phenomena of the injury or illness could also be expressed as a loss of a future role (Jansson & Bjorklund, 2007) .

In summary, there are a number of issues concerning the limitation of activities and participation restrictions due to MSDs that need to be explored and measured in this thesis. The impact of those issues is not only absence from work but also difficulties resuming active roles in home and work environments. Furthermore, the functional performance outcomes at the work place, such as lifting, carrying, pushing/pulling, and combined manual material handling, needs to be considered as there was a significant risk associated with back pain. Issues such as motivation, expectation, self-image, maintaining routines and habits need to be addressed in this research. It appears from previous studies that returning to work after an injury is a complex issue requiring it to be seen not as a single issue, but rather as a dynamic problem with individual activities and participation restrictions.

2.1.3 Studies focusing on personal and environmental factors

Personal factors and types of occupation have a significant impact on the prevalence of MSDs. A cross sectional study by Normadiah (2005) of 330 doctors (house and medical officers) who were currently working at Kuala Lumpur Hospital found that 74.6 % were currently affected, or had been affected in the past by low back pain. Of those, 59.2 % initially not having low back pain before working, developed low back pain during their working life, and 87.3% of those who already had low back pain prior to working continued to have low back pain during their working life. Females were noted to have a significant odds ratio of 2.11 (CI: 1.05-4.23). Those of Indian ethnicity had 1.12 (CI: 0.42-2.95) higher

risk, and those of Chinese ethnicity had a lower risk of 0.69 (CI: 0.30-1.58) in the development of low back pain compared to the Malay ethnic group. Married respondents were 1.07 (CI: 0.52-2.18) at slightly higher risk when compared to single respondents. The prevalence of low back pain among respondents who smoked was higher than those who did not smoke, with odds ratio of 1.27 (CI: 0.25-6.53). Factors such as female gender, higher weight and height were found to have statistically significant association with low back pain. However, they were observed not to be predictive of low back pain. There were no significant associations found between other socio-demographic factors and low back pain. This study indicated that low back pain is highly prevalent among doctors who adopt poor postures while working over a long period of time. These results support the role of ergonomic factors in the pathogenesis of low back pain among doctors. This also highlights the need for the hospital managers to look at the risk factors associated with low back disorders, and to have a prevention and management plan for the doctors in particular, and also for the junior doctors.

A cross sectional study by Mohd Nizam and Rampal (2005) was conducted among oil palm plantation workers in Selangor from July to December 2001 to study the prevalence of back pain and individual, physical and psychological factors associated with it. A total of 103 workers from three oil palm plantations, including harvesters and field workers, were selected by convenience sampling. Data were collected using a self-administered questionnaire. The time-motion studies were also conducted on four selected plantation workers. The prevalence of back pain that was related to work was experienced throughout their work in the plantation and in the last 12 months was 76.7 % and 67.0 % respectively. After adjusting on possible confounders by using a multivariate analysis, a high frequency of bending forward was the only suggestive predictor, such as the removal and disposal of domestic refuse (sanitation)

work increasing the risk of back pain by fivefold (5.096) (CI:1.421-18.273). It was suggested that both management and workers pay serious attention to ergonomic aspects particularly when performing sanitation activities.

Unhealthy environments at the work place can not only add to the prevalence of MSDs, but also create long term psychological consequences. The prevalence of MSDs was not only due to physical demands such as work that involved manual materials handling, but also included people who were working in an office (Fagarasanu & Kumar, 2006). Fagarasanu and Kumar (2006) reported that in a population of office workers (n=140) in a telecommunication company in Canada, the body parts most at risk for developing MSDs are the neck (77.5%), shoulders (left 31%, right 50%) lower back (74.2%) and wrists (left 86.5%, right 95.5 %) . In fact, the job description related to computer usage which included working at least 4 hours/day for 5 days/week created most injuries (Fagarasanu & Kumar, 2006).

A systematic review by Alnaser et al. (2007) of occupational and personal factors that were associated with occupational musculoskeletal injuries among health care providers aimed to identify the psychosocial issues as a result of the injuries. They found that injured worker with MSDs were not only found in industrial areas, but also in the health care environment. Patient handling was the most common personal occupational factor that caused work-related injuries, even more than experience and age. Fear, anger, isolation, inability to perform duties and negative impact on leisure activities were common psychosocial issues as a result of the injuries.

Chan and Spencer (2004) tracked five participants with hand injuries in manufacturing electronics at Texas (US), and they found that the participants who went through periods of

depression were unable to perform their occupational roles. This experience continued before they made any successful adaptive responses. Occupational roles in this study were related to their daily routine such as roles of a worker or spouse or parent. Furthermore, Lee et al. (1985) used the Goldberg's General Health Questionnaire to interview 62 participants with occupational hand injuries at Hong Kong and found that participants experienced depression, anxiety, and sleeplessness. In addition, they concluded that limited participation in meaningful activities led to dissatisfaction and then to psychological distress.

Long-term psychological consequences due to MSDs can affect sustainability of employment tenure. Cromie et al. (2002) interviewed 18 physical therapists in Australia in the process of changing careers due occupation related musculoskeletal injuries. She found that these physical therapists were in a state of shock or denial about their injury. Because they were therapists who worked with people with such injuries had a breadth of professional knowledge on musculoskeletal injuries, they believed they were invincible to injuries because they were armed with the knowledge to protect themselves (Cromie et al., 2002). Therefore, it is important to understand the view of the workers in relation to the socio-cultural context at their own work environment scenario.

It is paramount to understand the individual's perceptions on the process of transition following their injury. This is related to the principles of client centred approach, an approached used by health professionals that plays a key role in the rehabilitation process of injured workers through enhancing the person-job-environment fit (Cromie et al., 2002; Dickie, 2003; Keough & Fisher, 2001; Lambeek et al., 2010; Rouge-Maillart, Jousset, Gaches, Gaudin, & Penneau, 2004). In fact, the health professional also needs to take care of his or her health condition. The Bureau of Labour Statistics, USA described that the working

conditions of health practitioners as exhausting and strenuous due to spending hours conducting therapy and facing occupational risk factors such as manual lifting of patients and equipment. Furthermore, Alnaser (2007) extrapolated that approximately 30% of the health practitioner workforce were also at a risk of occupational musculoskeletal injuries .

It is important to look at the inter-relationships between personal and environmental factors that may affect RTW outcomes. Vuuren et al., (2007) did an analytical cross-sectional epidemiological study among 366 steel plant workers in South Africa to examine the prevalence and association between lower back problems (LBP) and family and workplace-related psychosocial risk factors. The study found that the prevalence of LBP to these variables was 35.8 % family and 15.3 % workplace respectively. Logistic regression analysis indicated significant adjusted odds ratios for: negative perceptions of workplace support [2.32 (CI: 1.09 – 4.92)]; unexpected events [2.58 (CI; 1.19 – 5.59)]; and working under time pressures and deadlines [2.83 (CI; 1.24 – 6.48)]. A significant univariate association was also found between LBP and negative perceptions of family support is [1.97 (CI: 1.06 – 3.68)] (Vuuren et al., 2007). These findings suggest that workers who feel more in control on the job and who have good family and workplace support systems intact are less likely to experience LBP. The authors concluded that management should be encouraged to develop appropriate support and organizational systems which may be an inexpensive, but potentially beneficial means of reducing worker stress and LBP (Vuuren et al., 2007).

In summary, previous research underlines the importance of understanding the contexts of personal factors for injured workers in returning to work. Previous studies have shown associations of personal factors such as gender, education, diagnosis, type of employment,

working experience and sick leave (Jabar, 2005; Mohd Nizam & Rampal, 2005). However, no studies have focused on how the worker is able to adapt to, or cope with, MSDs in relation to basic tasks of living, as well as managing life and relationships, and satisfaction.

In the context of environmental factors, previous studies have shown that working hours, psychological and physical workloads, and the type of support provided by employer, family and health professional play a major role in the recovery of MSDs (Alnaser, 2007; Cromie et al., 2002; Dickie, 2003; Fagarasanu & Kumar, 2006; Keough & Fisher, 2001; Vuuren et al., 2007) . Further study needs to explore the work environment, especially the issues of support obtained at different phases of the RTW programme as it will provide an insight for the employer and health professionals regarding how to improve work conditions, interventions, and the required supports including financial.

Table 1: Overview of the evidence for the prognostic value factors concerning people with MSDs ordered by components of International Classification of Functioning, Disability, and Health (ICF) (WHO, 2001).

Components	**Variable Outcome**	**Positive association**	**Negative association**	**No association**	**Evidence**
Impairment of body function and structure	Pain,	(Soares & Grossi, 2000), (Heuvel et al., 2007)			Strong (positive) more on female
	Stress	(Jonsson, 2000)			Strong (positive)
	Anxiety	(Jonsson, 2000; Soares & Grossi, 2000)			Strong (positive)
	Depression	(Soares & Grossi, 2000)			Inconsistent
Activities Limitation	Specific disabilities for back	(Agnes et al., 2007; Alexander et al., 2007; Karjalainen et al., 2003a; Vuuren et al., 2007)			Inconsistent
	Specific disabilities for neck			(Karjalainen et al., 2003b)	No
Participation restriction	Role limitations	(Jonsson, 2000; Westman et al., 2006)			Inconsistent
	Social functioning	(Karjalainen et al., 2003a; Westman et al., 2006)			Inconsistent
	Physical health				

	functioning				
	Mental health functioning	(Jonsson, 2000; Lotters et al., 2005)			Inconsistent
Personal factors	Age, Gender, Ethnic	(Jabar, 2005; Lotters et al., 2005; Mohd Nizam & Rampal, 2005; Soares & Grossi, 2000)			Strong (positive)
	Body mass index	(Lotters et al., 2005; Sjostrom et al., 2008; M. Sullivan et al., 2005)			Strong (positive)
	Diagnosis	(Bengt et al., 2003; Lotters et al., 2005; Sjostrom et al., 2008; M. Sullivan et al., 2005)			Strong (positive)
	Education	(Sjostrom et al., 2008; M. Sullivan et al., 2005)			Strong (positive)
	Type of occupation	(Alnaser, 2007)			Strong (positive)
	Smoking	(Jabar, 2005)			Strong (positive)
	Sick leave	(Martimo et al., 2009)	(Heuvel et al., 2007)	(Sjostrom et al., 2008)	Inconsistent
Environmental factors	Working hours	(Bengt et al., 2003; Lotters et al., 2005)			Strong (positive)

	Psychological work load	(Lotters et al., 2005)		(Sjostrom et al., 2008)	Strong (positive)
	Physical work load	(Fagarasanu & Kumar, 2006; Jabar, 2005; Lotters et al., 2005; Martimo et al., 2009; Mohd Nizam & Rampal, 2005)		(Sjostrom et al., 2008)	Strong (positive)
	Employer/Peers	(Vuuren et al., 2007)			Strong (positive)
	Family	(Vuuren et al., 2007)			Strong (positive)
	Health Professionals				
Others RTW outcome	Motivation	(Cromie et al., 2002; Dickie, 2003; Heuvel et al., 2007)			
	Productivity	(Agnes et al., 2007)		(Heuvel et al., 2007)	Inconsistent
	Acceptance				
	Fear	(Cromie et al., 2002; Keough & Fisher, 2001; M. Sullivan et al., 2005)			Inconsistent
	Cost effective	(Bengt et al., 2003)			Strong (positive)
	Days to rehab investigation	(Bengt et al., 2003)			Inconsistent

2.2 Return to work for workers with musculoskeletal disorders: Types of interventions, instruments, and outcomes

In the following review of the literature, the focus on the various interventions, measurement tools and outcomes of the study will be explored, analysed, and critiqued. As MSDs are classified by the International Classification of Diseases (ICD10) (World Health Organization, 2010) into subcategories based on the site of the lesions, the following discussion will group the different approaches to RTW programmes and then subcategorize it into different body locations, for example, at the back, neck and shoulder. At the end, the literature review focus will be on RTW with workers with MSDs having to deal with pain and disabilities as well as absence from work due to their injury.

2.2.1 Multidisciplinary team

2.2.1.1 Subacute low back pain

A systematic review including literature up to November, 2002 was completed by Karjalainen et al. (2003a), where the objective was to determine the effectiveness of multidisciplinary biopsychosocial rehabilitation for adults with subacute low-back pain. The authors found that there is moderate evidence of positive effectiveness in programmes that include a workplace visit by the health professionals to advise on equipment modifications and job tasks (Karjalainen et al., 2003a). The review was limited to people with subacute low back pain, i.e. pain duration between four weeks and three months after the injury. The multidisciplinary team approach consisted of a physician's consultation plus psychological, social or vocational intervention, or a combination of these.

The outcomes that were investigated were pain intensity (visual analogue scale, ordinal scale), global status (overall improvement) (SF36), disorder specific functional status (Roland Morris, Oswestry), generic functional status or quality of life (SF36, 15-D, Sickness Impact Profile, Health Assessment Questionnaire), ability to work (sickness absence, return to work, number of days off work), health care consumption and costs, and satisfaction with treatment. Out of 1,808 abstracts and the references of 65 reviews, there were only two relevant articles that fulfilled the criteria on subacute low back pain. Although these were both Randomised Controlled Trials (RCTs) both were considered to be of low methodological quality. From these two studies, Lindstrom et al., (1992a; 1992b; 1995) and (Loisel et al., 1997), there was moderate scientific evidence showing that multidisciplinary rehabilitation, which includes a workplace visit or more comprehensive occupational health care interventions, helps patients to return to work faster, results in less sick leave and alleviates subjective disability (Karjalainen et al., 2003a).

One of the included studies, Lindstrom (1992a; 1992b; 1995) involved blue-collar workers of the Volvo company in Gothenburg, Sweden, who had been sick-listed for eight weeks because of subacute and nonspecific mechanical low back pain (N= 103) aged between 19 and 64 years. The authors studied the effectiveness of a graded activity programme combined with a workplace visit compared to traditional care. The other study (Loisel et al., 1997) involved workers receiving occupational interventions that included workplace modification. These workers had accumulated absences of four week from work during the past year (N= 130) and were aged between 18 and 63 years. The authors examined occupational and clinical interventions separately and compared them to the usual care for employees.

Pain intensity and ability to work were reported in both studies, and both used a one-year follow-up period. In Loisel's study, randomization was adequately performed but not in Lindstrom's study. Neither of the studies blinded either patients or therapists. Avoidance of

co-interventions or their equal distribution throughout study groups was not reported adequately and the drop-out rate was low, being 2 % (n=2) in Lindstrom's study and 20 % (n=26) in Loisel's study. Participants' improvements from both studies were found in subjective disability and disorder specific functional status. No effects could be attributed to the intervention in the intensity of pain. The latter results support a hypothesis that the beliefs in the development of biopsychosocial problems are not always associated with the intensity of pain, but rather with the functional status and self-experienced disability. Karjalainen (2003a) commented that a larger study population may have shown a statistically significant effect in the reduction of pain intensity because pain is a far more subjective outcome than, for example, return to work, and the experience of pain intensity varies more between the patients.

2.2.1.2 Neck and shoulder pain

A systematic review by Karjalainen (2003b) up to 2002 reported that there were only two relevant studies from 1,808 abstracts and references of 65 reviews that satisfied the criteria of the effectiveness of multidisciplinary biopsychosocial rehabilitation for neck and shoulder pain among working age adults. The terms of biopsychosocial rehabilitation and the outcome is the same as the author's previous study (Karjalainen et al., 2003a) where the age criteria for working adults was between 18 and 65 years. Two relevant studies were found on neck and shoulder pain Ekberg (1994) and Jensen (1995). Ekberg (1994) used a non-randomized clinical trial study which was considered to be of low quality (score =2) by the authors using a rating system with levels of evidence (van Tulder et al.,2000). This was due to the method of non-randomization although they did report blinding of patients but not the therapists. Although patients were successfully followed, intention-to-treat analysis was not undertaken. The population of the study was females and males aged between 18 and 59 years who were working and who had consulted a physician about neck or shoulder disorder.

The trial showed no difference between the active multidisciplinary rehabilitation and traditional care in terms of sick leave, pain, health-related behaviour and working conditions in a two- year follow-up. The only significant difference between the groups at baseline was the number of blue-collar workers and employees in services and health care where in the multidisciplinary intervention group, 91 % of patients were blue-collar workers and 9 % were employees in health care, whereas in the traditional group, 55 % of patients were blue-collar workers and 43 % were employees in services and health care.

Karjalainen et al. (2003b) recommended that the industry groups should be equally distributed, especially as the loading of blue-collar workers may have influenced the results. Jensen's (1995) randomized control trial was also considered a low quality (score=3). This was because the method of randomization was not described, there was no intention-to-treat analysis, and therapists were not blinded (although patients were). The study population was between aged 20 and 55 years with chronic neck and shoulder pain. In this study, the role of the psychologist in multidisciplinary treatments was explored. Both the intervention and the control groups participated in multidisciplinary rehabilitation, but in the intervention group, psychologists administered the behavioural components of the multimodal approach directly to the patients, whereas in the control group, clinical psychologists participated in the multidisciplinary health care team as a supervisor. Both groups improved after comparison in terms of clinical outcomes of pain intensity and disorder-specific functional status at the six-month follow-up, and ability to work at 12-month and at 18-month follow-ups, but there was no statistically significant difference between the groups. Likewise, it is more cost-effective to use a clinical psychologist as a supervisor of the multidisciplinary health care team rather than have the clinical psychologist execute behavioural treatment him/herself. Karjalainen et al. (2003b) concluded that there is an urgent need for high quality trials to find out the

effectiveness in this multidisciplinary biopsychosocial rehabilitation for neck and shoulder pain compared with other rehabilitation facilities.

2.2.1.3 Back and Neck

A two-year follow-up study was conducted into the effectiveness of a multidisciplinary rehabilitation programme with emphasis on musculoskeletal disorders mainly neck and back pain of 60 patients (Sjostrom et al., 2008). The rehabilitation programme was conducted over a period of 7 weeks, 4 hours a day, 5 days a week and was individually adapted. It consisted of physical activity in several forms, relaxation, theoretical and practical education and individual guidance but did not to mention sustainability at the workplace. Randomization of the rehabilitation program was not done due to the by-law that every Swedish citizen has the right to undergo rehabilitation, and at the same time, participants were from a small community who may communicate with one another about their experience.

The measurement instruments used were the Global Self-Efficacy Index (GSI) questionnaire for the evaluation of health-related quality of life (QOL) (Physiotherapy, 1998), Hospital Anxiety and Depression Scale (HADS) for measuring anxiety and depression (Zigmond & Snaith, 1983), and the stress test for assessing the level of self-rates stress behaviour (Claesson et al.,2003). The GSI questionnaire is divided into three main topics; physical condition, mental condition and sleeping disorders. The test-retest reliability of the test was 0.8 – 0.93 and the validity was also good in its use among healthy people and patients with neck/shoulder/low-back pain, arthritis of the hip, knee, and multiple sclerosis (Physiotherapy, 1998). The HADS consists of 14 items and has two subscales, one for measuring anxiety and the other for depression. The scale is presented as a reliable instrument for screening clinical anxiety and depression in patients attending a general medical clinic. The internal consistency of the two subscales correlated at a range from 0.7 to 0.42 for the anxiety items ($p < 0.01$).

The depression correlated at range from 0.6 to 0.3 ($p < 0.02$) (Zigmond & Snaith, 1983). The stress scale consists of 20 statements referring to stress behaviour in everyday life situations and is based on two major themes; time urgency/impatience and easily aroused irritation/hostility. Internal consistency between the 20 items is high (Cronbach's alpha = 0.90) (Claesson et al., 2003).

The study found that at the 2-year follow-up the full-time sick leave had decreased by 37 % ($p < 0.001$) in the women, and by 25% ($p < 0.05$) in the men. Both women and men showed an increase QOL and decreased anxiety, depression and self-experienced stress compared to the baseline of the rehabilitation programme (Sjostrom et al., 2008). However, in this study the authors did not mention the numbers who had returned to work nor what capacity they regained in their work place. This study indicates the importance of evaluating the effectiveness of the RTW programme by not only exploring the quality of life, levels of anxiety, depression and self-experienced stress over period of time, but also the experiences and limiting factors for workers with MSDs at the workplace.

2.2.1.4 Fibromyalgia and musculoskeletal pain

A systematic review of publications up to 1998 by Karjalainen (2009) reported that there were only seven relevant studies (1,050 patients) from 1,808 abstracts and references of 65 reviews that satisfied the criteria of the effectiveness of multidisciplinary biopsychosocial rehabilitation for fibromyalgia and musculoskeletal pain among adults of working age. Fibromyalgia is a chronic disorder characterised by widespread pain, tenderness, and stiffness of muscles and associated connective tissue structures that are typically accompanied by fatigue, headache, and sleep disturbances (National library of Medicine, 2003). None of those studies were considered RCTs of high methodological quality. The terms for biopsychosocial rehabilitation and the outcomes reported were the same as those in the author's previous

study (Karjalainen et al., 2003a; Karjalainen et al., 2003b) where the age criterion for working adults ranged between 18 and 65. Four of the included RCTs on fibromyalgia were graded as low quality and suggested no quantifiable benefits (Burckhardt, Mannerkorpi, & Bjelle, 1994; Nicassio, Radojevic, & Weisman, 1997; J. W. Vlaeyen, Teeken-Gruben, & Goosens, 1996; Wigers, Stiles, & Vogel, 1996).

Burckhardt's (1994) trial (n=99) only compared the effectiveness of education plus physical training with education, while Vlaeyen's (1996) trial (n=131) compared education and cognitive treatment with education and group discussion, and both studies had waiting list controls. Nicassio's (1997) trial (n=86) compared behavioural therapy with education and Wigers's (1996) trial (n=60) examined the benefit of stress management over aerobic exercise and treatment as usual. Similarly, both of these studies emphasised behavioural therapy. Three of the studies had pain intensity as a common outcome parameter, but they used different types of measurements, and the follow-up times varied (Burckhardt et al., 1994; Nicassio et al., 1997; Wigers et al., 1996).

Wigers (1996) reports that the effectiveness of stress management was neutral compared to aerobic exercises; similarly behavioural therapy compared to education alone had the same effectiveness (Nicassio et al., 1997). Stress management was more effective than usual care (Wigers et al., 1996), and a long term follow-up education programme combined with physical exercise was better than education alone (Burckhardt et al., 1994). Educational cognitive intervention was as effective as educational discussion intervention but the former intervention was more expensive (J. W. Vlaeyen et al., 1996).

Only three trials on widespread musculoskeletal pain were included (Lindh et al.,1997; Linton & Gotestam, 1984; Moore & Chaney, 1985). Lindh (1997) studied the effectiveness of outpatient multidisciplinary rehabilitation, but the intervention in the primary care control

groups was not described adequately. Linton's (1984) and Moore's (1985) trials concentrated on behavioural therapy, but had waiting list controls that authors considered inadequate for chronic conditions. Meanwhile, both of the trials had pain intensity as an outcome parameter, but the follow-up times were not comparable. Lindh (1997) had return to work as the only outcome parameter, and results based on the intention to treat analysis were not presented.

Karjalainen (2009) concluded that multidisciplinary interventions were considered to be ineffective in every intervention of the study. Although all trials were randomized, none were deemed to be methodologically high-quality RCTs, because the method of randomization was not described and there was no blinding the therapists and patients, with the exception of only one study, in which it was performed in an inadequate way. Methodological defects included blinding of the therapist (in none of the trials) and intention to treat analysis (used in only two of the seven studies) (Karjalainen et al., 2009). Karjalainen (2009) suggested that to justify the effectiveness of multidisciplinary rehabilitation, good quality clinical trials that tackle questions concerning the effectiveness and cost effectiveness require further research.

A 5-year follow-up study to assess quality of life and the effect of early a multidisciplinary rehabilitation team was done with 91 patients with musculoskeletal pain and disability. The study, known as the STAR project, was initiated in the country of Vastmanland, Sweden in cooperation with the Primary Health Care, the Social Insurance Office and the Occupational Health Centre (Westman et al.,2006). The programme contains various treatment modalities with combination of different disciplines. The model of treatment was based on the behavioural-medical approach, which implies effort made to take advantage of both medical and behavioural scientific competence (Haldorsen et al.,1998). The basic programme was a scheduled group, with the participants attending 3.5 hours per day, 5 days a week for 8 weeks

(6 weeks per group) with eight to 10 patients in each group. Group work consisted of physical training, warm water pool training, circulation encouragement exercises or lightweight training with sequence controlled equipment, body awareness exercises, relaxation training and creative activities (Westman et al., 2006).

The visual analogue scale (VAS) was used to assess the intensity of pain by means of 0-mm to 100-mm calibration, with 0 indicating no pain or discomfort and 100 indicating unbearable pain or discomfort. The VAS has been validated as a measurement for chronic and experimental pain (Huskisson, 1983). The disability rating index (DRI) was used to assess physical function, where the patients mark on a 100-mm VAS in accordance with their presumed ability to perform the daily physical activities in a set of questions (Salen et al.,1994). The health anxiety and depression (HAD) scale was used to measure anxiety and depression inclination (Zigmond & Snaith, 1983). The quality of life (QOL) instrument was used to explore the level of life satisfaction; it contains 10 items that are rated on a six-point scale (Fugl-Meyer, Eklund, & Fugl-Meyer, 1991). The health profile assessment (HPA) was used to screen individuals at risk and who have a motive for revising their way of living (Malmgren, 1987).

In this study, the authors did not discuss at all the validity and reliability of those instruments except the VAS. They found that improvements in pain, perceived health, and psychosomatic symptoms were maintained at the 5-year follow-up. In addition, improvements in function, quality of life, and the level of acceptable pain were significant in comparison to baseline. The STAR programme improved the quality of life and the effects were basically maintained at the end of 5 years. Work capacity as reflected in RTW had increased greatly by 81 % at 1-year follow-up and was substantial by 58 % at the 5-year follow up (Westman et al.,2006). This study indicates that it is important to evaluate the effectiveness of the RTW programme

by measuring pain and other factors associated with MSDs such as physical and mental function, work capacity, and quality of life over a period of time. The duration of follow-up should be 1 to 5 years.

2.2.2 Work Conditioning, Work Hardening and Functional Restoration

2.2.2.1 Chronic back pain

Schonstein (2003) reviewed 23 studies in relation to work conditioning, work hardening and functional restoration published before May, 2000. The author concluded that physical conditioning programmes that include a cognitive-behavioural approach, plus intensive physical training that includes aerobic capacity, muscle strength and endurance supervised by a physiotherapist or multidisciplinary team, seem to be effective in reducing the number of sick days for some workers with chronic back pain compared to usual care. Likewise, the author was unable to conclude that physical conditioning programmes are effective in terms of reducing the number of sick days lost due to back pain when the intervention compared to usual care. Although the terms of reference of the intervention was different from those of previous studies (Karjalainen et al., 2003a; Karjalainen et al., 2003b, 2009; Schonstein et al., 2003) the outcome parameters are similar but more detailed on the physiological outcomes of physical examination/testing (e.g. range of motion, muscle strength, lifting capacity, and fitness test). Schonstein (2003) examined the methodological quality of the studies and concluded that the majority of studies (78 %) described dropout rates for both groups, and compliance in the intervention group was measured in 10 (56 %) of the studies. Only two descriptive items were poorly addressed in terms of consideration of adverse effects (39 %) and whether the subjects in both groups were similar with respect to the distribution of their symptoms (50 %). Most reports (94 %) provided estimates of the duration of the limited functional ability of participants. Schonstein (2003) suggests that the effectiveness of physical conditioning for neck pain must be looked into together with cost-benefit analysis.

There is also a need for more sensitive steps (holistic approach) to be taken during stages of the return-to-work process and the effects of the job-attached status in the pre-injury job.

2.2.3 Manual Material Handling (MMH) Advice and Assistive Devices

Martimo (2009) reviewed eleven studies in relation to manual material handling (MMH) advice and assistive devices for preventing back pain in workers. The studies were published prior to September, 2005. Six RCTs (17,720 employees) and five cohort studies (772 employers) fulfilled the criteria for the prevention of back pain, but none for the treatment. The studies were undertaken in various geographical regions-with three studies from US, and the others from the Netherlands, Canada, France, Germany, Australia, Sweden, Denmark and France. In this review, the outcome of the primary prevention studies was the rate ratio for the duration of frequency in relation to number of occurrence symptoms of non-specific back pain with or without radiating pain taken during follow-up. The secondary outcome was the number of re-education sessions and number of days of sick leave due to back pain. The authors concluded that there is limited to moderate evidence that MMH advice and training, with or without assistive devices, do not prevent back pain, back pain-related disability or reduce sick leave when compared to no intervention or alternative interventions. They also recommended large scale trials with follow-up covering several years to adequately evaluate preventive interventions, as the incidence of new cases of back pain is fairly low. In addition, better methods of combining back pain outcome measures, back-related disability and sickness absence are needed for synthesis of the study results in systematic reviews.

2.2.4 Ergonomic and Physiotherapeutic Interventions

2.2.4.1 Complaints of the arm, neck, or shoulder

Verhagen et al. (2006) reviewed 21 studies in relation to ergonomic and physiotherapeutic interventions for treating work-related complaints of the arm, neck or shoulder in adults. The

studies reviewed were published prior to March, 2005. The authors concluded that there is limited evidence for the effectiveness of keyboards with an alternative force-displacement of the keys or an alternative geometry, the effectiveness of exercises compared to massage, breaks during computer work compared to no breaks, massage as an add-on treatment to manual therapy, and manual therapy as an add-on treatment to exercises. The outcomes were similar to Karjalainen's (2003a; 2003b) but included more on health care cost consumption (e.g. physician's consultations, physiotherapy, ergonomic adjustments, intake of analgesics) and recurrence of injury (Verhagen et al., 2006). The types of participants were those 18 years and above, and suffering from "Complaints of the arm, neck or shoulder". Verhagen et al. (2006) recommended there is a need for an agreed definition of what can be considered as 'work related disorders' and large adequately powered trials are needed that focus on appropriate allocation concealment, blinding of at least outcome assessment and, if possible, patient and therapist, and an adequate data presentation and analysis.

2.2.5 Multidisciplinary plus Occupational Therapist/Ergonomist

A prospective controlled intervention study was conducted with employees who suffered from MSDs where the outcomes measured were sick days, direct saving cost of the intervention including the addition of an occupational therapist/ergonomist to the programme, costs generated by vocational and occupational training, as well as ergonomic improvements and purchasing of tools and time for complete rehabilitation investigations (Bengt et al.,2003). Although the Swedish National Health Insurance Plan stated that employers are required by law to investigate suitable rehabilitation measures when an employee has been out on sick leave for 4 weeks or longer, and this information is forwarded to the local branch office of Swedish National Health Insurance Agency (FK), in reality only a minority of employers actually conduct a rehabilitation investigation within eight weeks.

A randomized control study was designed, where the FK case manager and occupational therapist addressed the intervention group. It aimed to enhance the FK's management of rehabilitation by involving a semi-structured assessment to review an employee's current psychological and physical work site evaluation. At the same time, the visits offered an opportunity for primary preventive actions, because employers in many cases were offered advice that is beneficial to other employees. The case manager at FK extended his or her work duties by including the role of the central integrator of the patients' rehabilitation process. This process entailed medical workups, medical rehabilitation and vocational training. The reference group received the same information about the study and questionnaires as did the intervention group. However, they were not part of the semi-structured interview nor were there any worksite visits and improvement offered to this group.

To assess the effects of the programme, a number of relevant variables were included; Medical diagnosis, days to rehabilitation investigation, days to rehabilitation plan, days to rehabilitation, rehabilitation costs, vocational service costs, 6-month sick days, 12-month sick days, age, gender, work hours, and self-rated health using a five-point response scale (SRH). The SRH questions covered views regarding vocational training, changes in work tasks, consequence of MSDs, opinion on ergonomic changes at the work place, impact of sickness on personal status (financial, accumulation of work, decreased social status, and feelings of not being wanted). MSD symptoms were rated on a four-point scale and revised and shortened from the Standardized Nordic Questionnaire for the analysis of musculoskeletal symptoms including a depiction of the body. Most of the questions and scales used had been previously validated in prior studies (Arnetz, 1999, 2001).

Bengt et al., (2003) found that the total mean sick days of the intervention group was significantly less ($p < 0.01$). The intervention group recorded 144.9 days compared to

reference group 197.9 days and the time taken to do the programme was significant ($p < 0.01$), 59.4 days for the intervention group and 126.8 days for the reference group. The direct costs savings were US$ 1,195 per case, yielding a direct benefit-to-cost ratio of 6.8. At baseline, the participants in the intervention group believed that they could influence things so that they would be able to go back to work ($p < 0.001$). At the 6 months follow-up, participants in the intervention group rated that the role of the FK as significantly more supportive and important during their rehabilitation process than did the reference group ($p < 0.05$). However, there was no significant difference between the groups regarding participants' ranking of their health even for those responding that their health was very good and fairly good were compared with all others. The authors concluded that the management of MSDs should have a greater focus on early return to work and building on functional capacity and employee ability, allowing the case managers a more active role. Additionally, the involvement of an occupational therapist/ergonomist in workplace adaptation meetings might also be beneficial (Bengt et al., 2003).

Desiron, de Rijk, Van Hoof and Donceel (2011) conducted a systematic review to analyse the effectiveness of occupational therapy interventions (OTIs) in RTW. Search criteria included: "return to work", "occupational therapy", "occupational rehabilitation" and "vocational rehabilitation". For quality criteria, methodological quality, and internal and external validity were taken into consideration. Six studies fulfilled the search and quality criteria set by the authors. These included 899 patients aged above 18 years when they participated in rehabilitation programmes. Only four studies involved participants with musculoskeletal disorders (Jousset et al., 2004; Joy, Lowy, & Mansoor, 2001; Lambeek et al., 2010; M. J. Sullivan, Adams, Rhodenizer, & Stanish, 2006).The authors concluded there was sufficient evidence for OTIs in rehabilitation programmes which contribute to RTW. However, it is not clear what the effective ingredients are, except for work place interventions

based on participatory ergonomics, with involvement of a supervisor, and a graded activity programme based on cognitive behavioural principles, in Lambeek et al. (2010).

2.2.6 Community-Based Psychological Intervention

A study was conducted using community-based psychological intervention for work-related MSDs for 215 workers compensation board claimants who had been absent from their work for a mean number of 28.8 weeks in Nova Scotia, Canada (M. J. L. Sullivan et al., 2005). The Pain disability programme (PDP) was developed as a community-based, standardized 10-week treatment programme. It was designed to specifically target psychological risk factors for pain-related disability complementing existing community-based services for the treatment of occupational injury (e.g. medical management and physiotherapy) (M. J. L. Sullivan & Stanish, 2003). The risk factors targeted by the PDP programme include fear of movement/injury, pain catastrophising, perceived disability and depression. Psychologists in communities across the province were trained to provide the intervention (M. J. L. Sullivan et al., 2005).

The PDP involved the use of structured activity scheduling strategies and graded activity involvement to target risk factors, such as fear of movement/re-injury and perceived disability. Thought monitoring and cognitive restructuring strategies were used to target catastrophic thinking and depression. At the same time, in the final stages, there were activities to facilitate re-integration into the workplace, but these were not specified in the programme (M. J. L. Sullivan et al., 2005).

The measurement instruments used included the Tampa Scale for Kinesiophobia (TSK), which is a 17-item questionnaire that assesses fear of (re) injury due to movement (Kori, Miller, & Todd, 1990). The TSK has been shown to be internally reliable (coefficient α =

0.77) (Vlaeyen et al.,1995). The Pain Catastrophising Scale (PCS) consists of 13 items describing different thoughts and feelings that individuals may experience when they are in pain. The PCS has been shown to have high internal consistency (coefficient α = -0.87) (M. J. L. Sullivan, Bishop, & Pivik, 1995) . The Pain Disability Index (PDI) assesses the degree to which respondents perceive themselves to be disabled in seven different areas of daily living (home, social, recreational, occupational, sexual, self-care, life support). The PDI has been shown to be internally consistent and significantly correlated with objective indices of disability (Pollard, 1984). The Beck Depression Inventory II consists of 21 items describing various symptoms of depression and has shown a reliable and valid index of depressive symptoms in chronic pain patients and primary care medical patients (Beck, Steer, & Brown, 1996). The McGill Pain Questionnaire was used to assess current participant pain severity by endorsing the adjectives that best described their current pain experience (Melzack, 1975). The pain rating Index is considered one of the more reliable and valid indices of an individual's chronic pain experience (Turk, Rudy, & Salovey, 1985). It was found that there were reductions of the targeted risk factors from pre-treatment to post treatment: catastrophising (32%), depression (26%), fear of movement/re-injury (11 %), and perceived disability (26%).

Logistic regression indicated that elevated pre-treatment scores on fear of movement, re-injury and pain severity were associated with a lower probability of RTW. A second logistic regression addressing the relation between risk factor reduction and RTW revealed that only reductions in pain catastrophising were significant predictors of RTW (M. J. L. Sullivan et al., 2005).

The above study only shows the impact on short-term RTW outcomes where 63.7 % of participants returned to work within 4 weeks of treatment termination but there is no data on

the sustainability of their capacity at their work place. The absence of a control group or comparison group also does not allow the determination of the specific effects of the intervention. This study indicates that it is important to evaluate the effectiveness of the RTW programme by measuring MSD symptoms of pain and their associations such as functional mobility and disability perception, however this would be more meaningful if results are compared between the intervention group and a comparison or control group.

2.2.7 Effect of Health Status on RTW and sickness absence

One prospective cohort study with a one year-follow up regarding health status, its perceptions, and effect on return to work and recurrent sick leave was done with workers (n=253) who were on sickness absence between 2 and 6 weeks due to MSDs (Lotters et al., 2005). In this study, RTW was defined as returning on full duty in the original job. Study participants were sent follow-up self-administered questionnaires within 2 weeks of their return to work and after twelve months of the initial sick leave date. Study participants who did not return to work within twelve months were not eligible for this study. The follow-up was used to collect information on changes in symptom status, functional status, and general health.

In this study, a10-point perceived pain numerical rating scale had been used to determine the level of perceived pain (Von Korff, 1994). Functional disability was assessed by the Roland Morris Disability Questionnaires for back complaint (Rolland & Morris, 1983) and general health was measured by the SF-12 (Ware, Konsinki, & Keller, 1996) and Euroqol-5d (EuroQol Group, 1990). The participants were enrolled in the study by occupational health physicians during their consultations, or selected from the absenteeism register from a large Dutch occupational health service.

It was found that in terms of health status (perceived pain, functional disability, and all general health measures) at the time of return to work, 88 % of the 204 participants improved significantly ($P < 0.01$), but this was significantly worse for the 12-month follow up where 79% of the 184 workers experienced higher perceived pain and functional disability and poorer physical health besides higher pain and disability. The authors of the study hypothesized that workers with MSDs who have returned to work with full duties, especially those with previous episodes of sick leave, may require additional guidance to further improve their physical health and functional capabilities.

2.2.8 Workplace intervention

Carroll, Rick, Pilgrim, Cameron and Hillage (2010) reviewed 10 articles in relation to whether interventions involving the workplace are more effective and cost-effective in helping employees on sick leave return to work than those that do not involve the workplace at all. They included nine trials from Europe and Canada reporting interventions at the work place, with the population in eight trials suffering from back pain and related musculoskeletal conditions. The majority of trials were of good or moderate quality, but only four articles evaluated the cost-effectiveness of interventions.

Interventions at the workplace involving employees, health practitioners and employers working together to implement work modifications for the absentee, were found to be more consistently effective than other interventions. They also found that early intervention at workplace was effective. In addition, economic evaluations indicated that interventions with a workplace component are likely to be more cost effective than those without. The authors concluded that stakeholder participation and work modification are more effective and cost effective at returning adults with musculoskeletal conditions to work than other workplace-linked interventions, including exercise.

Tullar et al. (2010) reviewed 26 studies based on content and quality in relation to effectiveness of occupational safety and health interventions in health care settings on musculoskeletal health status. The studies included were published prior to 2009. The studies were undertaken in various geographical regions with four studies from Sweden, and two studies each from the US, Norway and Finland. Each of the following countries contributed one study: U.K., France, Canada, Israel and Australia. The primary job titles studied were nurse, nursing aide, nursing assistant and licensed practical nurses. The authors concluded that there is evidence supporting exercise for providing positive health benefits, but that manual handling training alone is not effective. Exercise interventions and multi-component patient handling interventions (MCPHI) were recommended as practices to consider. A multi-component intervention includes a policy that defines an organizational commitment to reducing injuries associated with patient handling, purchase of appropriate lift or transfer equipment to reduce biomechanical hazards and a broad-based ergonomics training program that includes safe patient handling and/or equipment usage. They also concluded that MCPHI can be evaluated if the term multi-component is clearly defined and consistently applied.

Aas et al. (2011) reviewed ten studies that involved clinical trials with 2745 participants aged 18 to 67 years regarding the effect of workplace interventions for workers with neck pain. The workplace interventions comprised education about stress management, principles of ergonomics, anatomy, musculoskeletal disorders, and the importance of physical activity. They taught ‘pause gymnastics’, how to use a relaxed work posture, proper positioning, the importance of rest breaks, and strategies to improve relaxation. Some studies also included education on how to modify work tasks, workload, working techniques, working positions, and working hours. Several studies made suggestions on workstation adjustments and recommended alternatives to the existing furniture and equipment at the workplace. The

authors found low quality evidence that neither supported nor refuted the benefits of any specific workplace intervention for pain relief and moderate quality evidence that a multiple-component intervention reduced sickness absence in the intermediate-term, which was not sustained over time. The authors recommended the need for high quality randomized clinical trials with well designed workplace interventions. They also recommend that researchers use the International Classification Functioning and Disability (ICF) terminology to ensure that all relevant dimensions of health and functioning are addressed in further clinical trials. In addition, the two main outcomes of pain relief and reduced sickness absence/return-to-work, would benefit from standardisation of measurement, and should always be included in these types of study.

2.2.9 Case management approach

Lai and Chan (2007) reported a pilot case management approach for injured worker that was conducted in Hong Kong. The case management approach was implemented by a case manager which his or her education background from occupational therapy or physiotherapy. They specifically worked closely with each of the reported injury cases. The case manager plays the roles of assessor, referral agent, counsellor, work-site liaison, and return-to-work (RTW) expert. A quasi-experimental study design was used to compare the actual RTW and workers' compensation outcomes with injured workers who worked in a cleaning company in a case management group (n = 296) and a conventional rehabilitation group (n = 137). Outcomes of the intervention were followed up at 6 months. The results indicated that the RTW rate was no difference between management and conventional rehabilitation groups; however, there were significant differences between them in relation to sick leave and compensation costs. Participants in the case management group had significantly fewer days of sick leave (mean = 27.5 and 41.6 days, respectively) and lower (mean = HK$7,212.2 and

$20,617.3, respectively) than those in the comparison group. The authors suggested that applying the case management approach to the Hong Kong workers' compensation system was more effective overall.

2.2.10 Summary of the above studies

In summary, the above studies have shown that the different interventions implemented produced different outcomes. Some of the above interventions were single, combined or complementary to each other for different outcome purposes. The numbers of the stakeholders involved in the studies are varied and each health professional plays a different and important role in managing MSDs. Occupational health physicians, psychologists, physiotherapists, occupational therapists, ergonomists, and case managers play a major role in managing MSD workers. The outcomes that have been measured can be categorized as overall health (pain and psychological factors, specific functional disabilities, and quality of life), personal factors (age, gender, body part injured, sick leave status), and environmental factors (working hours, psychological and physical workload).

Almost all the studies measured the effects on the RTW outcome but none of them studied the level of competency and value in relation to occupational functioning (basic tasks of living, managing life and relationships as well as satisfaction, enjoyment and actualisation). This is due to nature of the compensation available in the various countries.

Also, important issues have not been captured across the different RTW phases; some of the studies only reflected on the treatment and rehabilitation during off work or re-entry phases, and some studies focussed only on the maintenance phase. Most studies ignored the environmental issues, especially in relation to the physical and social-cultural dimensions. The exception was the study by Jansson and Bjorklund (2007) that looked at daily activities

and roles of the participants who were having various illnesses such as psychiatric, physical, somatic, allergic and hypersensitive illness. This study, however, only involved participants who were on sick leave and not those who had returned to work. By studying how the injured worker with MSDs copes with and adapts to his or her occupational functioning at various phases of the RTW programme or over a period time, the research undertaken as part of this thesis has been able to fill in the gaps in the literature regarding the RTW programme.

Table 2: Summary of the above studies in relation to type of interventions for return to work with musculoskeletal disorders

Reference	N	Study design	Type of Intervention	Sample of Population	Variables	Outcome /limitation and recommendation
(Karjalainen et al., 2003a) ,	103 130	Systematic Review. Two of RCTs Lindstrom et al., (1992a; 1992b; 1995) and (Loisel et al., 1997)	Graded Activity programme plus Work place visit. Work place visit plus clinical intervention	Subacute low-back pain working age adults	Pain intensity, disorder specific functional status , generic functional status or quality of life ,Sickness Impact Profile, Health Assessment Questionnaire, ability to work ,Health care consumption and costs, and satisfaction with treatment	Moderate scientific evidence. Development of biopsychosocial problems are not always associated with the intensity of pain, but rather with the functional status and self experienced disability
(Karjalainen et al., 2003b).	107 70	Systematic Review. Two of RCTs Ekberg (1994) and Jensen (1995)	Active multidisciplinary rehabilitation Versus traditional treatment. Multimodal cognitive-behavioural treatment versus psychologist functioning as a coach	Neck and shoulder pain among working age adults	Pain intensity Generic / Disorder functional status Ability to work Costs Prevalence of symptoms Anxiety, depression, helplessness	Urgent need for high quality trials
(Karjalainen et al.,	seven relevant	*Systematic Reviews*	Multidisciplinary rehabilitation	Fibromyalgia and musculoskeletal pain in	Pain intensity, global status, disorder specific functional	Good quality clinical trials that tackle questions

2009)	studies(1 050 patients)			working age adults.	status, quality of life, sickness impact profile, ability to work, health care consumption and costs, satisfaction with treatment	concerning the effectiveness and cost effectiveness require for further research.
(Schonstein et al., 2003)	23 relevant studies (3285 patients)	*Systematic Reviews*	Work conditioning, work hardening and functional restoration	Workers with back and neck pain.	Work status (time lost from work, time between injury and return to pre-injury status, RTW status, time on selected duties), functional status, physiological outcomes, functional status to job demand, predicted work capacity	Physical conditioning programs that include a cognitive-behavioural approach plus intensive physical training that includes aerobic capacity, muscle strength and endurance supervised by a physiotherapist or multidisciplinary team. Effectiveness of physical conditioning for neck pain must be looked into together with cost-effective analysis and more sensitive measures to the progressive stages of the return-to-work process and the effects of job-attached status in terms of the availability of the pre-injury job.
(Martimo et al., 2009) Netherland	(17,720 employees) (772 employer	*Systematic Reviews* Six RCTs and five	Manual material handling advice and assistive devices for	Back pain in Workers.	The rate ratio for the duration of frequency of episodes of non-specific back pain, with or without radiating pain, during	Large scale trials needed with several years follow-up are required to adequately evaluate

s, Canada, France, Germany, Australia, Sweden, Denmark and France	s)	cohort studies	prevention and promotion		follow-up, the mean difference in the number of days on sick leave due to back pain.	preventive interventions as the incidence of the new cases of back pain is fairly low
(Verhagen et al., 2006) Sweden	27 Qualified Studies (2110)	*Systematic Reviews*	Ergonomic and physiotherapeutic interventions	arm, neck or shoulder in adults.	Pain, global status, quality of life, sickness impact profile, health assessment questionnaire, disabilities of the arm, shoulder and measurement tool, ability to work, health care consumption, recurrence injury	Limited evidence for the effectiveness of adaptive keyboards and exercises compared to massage; breaks during computer work compared to no breaks; massage as an add-on treatment to manual therapy; and manual therapy as an add-on treatment to exercises. Need for an agreed definition of what can be considered as a 'work related disorders' and large adequately powered trials are needed that focus on appropriate allocation concealment, blinding at least outcome assessment and, if possible, patient and therapist, and an adequate data presentation and analysis.

(Sjostrom et al., 2008) Sweden	307	Prospective cohort studies A two-year follow-up	Multidisciplinary rehabilitation programme with emphasis on.	musculoskeletal disorders	Diagnosis group, gender, marital status, education, age, Body mass index, work history, working hours. Perceived pain, functional disability, physical health, mental health, general health, Perceived physical workload, high psychological workload, Sick leave	Recovery continues after RTW. MSDS workers need additional guideline after RTW especially those with history of sick leave. Low back pain was not more associated with health status than other MSDs.
(Sullivan et al.,2005) **Nova Scotia, Canada**	215	Prospective Studies 10 weeks	Integrating Psychosocial and Behavioural Interventions to Achieve Optimal Rehabilitation Outcomes.	Musculoskeletal disorders	Gender, diagnosis, Occupation, Absence sickness, pain, depression, perceived disability, fear of movement/re-injury, catastrophising (pain symptoms-pain sensation, sense of helpless, unable to cope with pain)	Risk factor reduction can impact positively on short-term return to work outcome, Outcome of rehab programme might improved by incorporate intervention target catastrophic
(Westman et al.,2006) Sweden	91	Prospective studies 5 year	Multimodal rehabilitation:	Musculoskeletal disorders a 5-year follow up	Age, sex, education, occupation, occupational status, Diagnosis, sick leave, duration ongoing sick leave before the program, pain intensity, function, anxiety and depression, quality of life, job strain, health profile assessment, patient satisfaction	Improved quality of life and the effects and the effects maintained at 5years, work capacity increased 81 % 1 year follow up, and 58% 5-year follow up
(Lotters et al., 2005) Canada	232	Prospective cohort studies 1 year	Consultation and registration occupational health service	Musculoskeletal disorders	Age, gender, Diagnosis, Marital status, education, Body mass index, work history, working hours, perceived pain,	Recovery continues after RTW. MSDS workers need additional guideline after

					functional disability, physical and mental health, general health, perceived physical and psychological workload	RTW especially those with history of sick leave. Low back pain was not more associated with health status than other MSDs.
(Bengt et al., 2003) Sweden	Intervention Group =65 Reference Group=72	Prospective cohort studies 1 year	Early Workplace Intervention	Musculoskeletal Disorders	Age, gender, type of occupation, working hours, sick leave, diagnosis, days to rehab investigation, plan, rehab costs, vocation services cost, self-rated health, total reimbursement	Focus on early return to work and building functional capacity and employee ability. Allow manager and ergonomist/therapist in workplace adaptation.
(Carroll et al., 2010) Europe and Canada	10 studies	*Systematic Reviews*.	Involved employees, health practitioners and employers working together, to implement work modifications	Back pain and musculoskeletal disorders	Effective and cost-effective	Stakeholder participation and work modification are more effective and cost effective at returning to work adults with musculoskeletal conditions than other workplace-linked interventions, including exercise.
(Tullar et al., 2010) Sweden, US, Norway, Finland, U.K., France ,	26 studies	*Systematic Reviews.*	Occupational safety and health interventions in health care setting	Musculoskeletal disorders	Providing positive health benefits	A multi-component intervention includes a policy that defines an organizational commitment to reducing injuries associated with patient handling, purchase of appropriate lift or

Canada, Israel, Australia						transfer equipment to reduce biomechanical hazards and a broad-based ergonomics training program that includes safe patient handling and/or equipment usage
(Aas et al., 2011)	10 studies	*Systematic Reviews*	Workplace interventions comprised education about stress management, principles of ergonomics, anatomy, musculoskeletal disorders, and the importance of physical activity	Neck pain	Pain relief and sickness absence	Low quality evidence in pain relief. Moderate quality evidence in reduced sickness leave Recommended randomized clinical trials, use ICF terminology for further clinical trials. Pain relief and reduced sickness absence/return-to-work included in these types of study
(Desiron et al., 2011)	6 studies	*Systematic Reviews*	Multimodal intervention including OT interventions	Musculoskeletal Disorders	Actual of number RTW.	There was sufficient evidence for OT interventions in rehabilitation programmes which contribute to RTW. However, it is not clear what the effective ingredients are, except for work place interventions based on participatory ergonomics, with involvement of a

						supervisor, and a graded activity programme based on cognitive behavioural principles
(Lai & Chan, 2007) Hong Kong, China	296 injured workers	A quasi-experimental study	Case management	Musculoskeletal Disorders	RTW rate was no difference but case management approach reduced sick leave and lower compensation cost significantly.	Case management approach was more effective overall. Nevertheless, the inherent problems associated with implementing such an approach within the existing system, which focuses on compensation and medical interventions, remained unresolved.

2.3 Specific aims of the studies undertaken

This thesis reports the results of a series of studies that focus on the occupational performance and participation, health status, impact on mental health, and experience and expectation of supports obtained in RTW programme conducted at SOCSO, Malaysia. The purpose of this research was to provide direction for interventions, management and related policies that can facilitate the injured workers in the RTW process. There were five key aims:

1. To translate and test the reliability and validity of Malaysian language version of Occupational Self-Assessment (OSA version 2.2).
2. To investigate the levels and associations of occupational functioning, activity limitations and participation restrictions in injured workers with MSDs who did not participate in a RTW programme
3. To examine the health status of workers with MSDs who are participating in the Malaysian national RTW programme.
4. To examine the occupational competence and psychological symptoms of workers with MSDs who are participating in Malaysia's national RTW programme.
5. To describe injured workers' experiences and expectation of the support obtained in Malaysian's national RTW programme.

2.4 Thesis Overview

These following chapters of this thesis have been constructed principally for publication in four professional journals and one multi professional journal. Two articles have been published. One article is in press one article has been reviewed and re-submitted and one article has been submitted and is awaiting review. The research for this thesis includes five studies conducted over three and half years that focused on workers with work-related musculoskeletal disorders registered with Malaysian's Social Security Organisation (SOCSO).

Chapters one and two have introduced the background of this research, the underpinning theoretical frameworks, and a discussion of the relevant literature and issues that emerged while the research was being completed. Chapters' three to seven focus on each of the five studies. Three chapters also contain a copy of either the published or submitted manuscripts. Two articles have been included in the published journal format; the unpublished manuscripts have been included in the layout required for submitted journal articles. Impact and summaries are provided at the end of each chapter. The published and unpublished articles contain their separate methods sections and reference lists.

Chapter three focuses on the translation and validation of the Malaysian language version of the OSAv2.2. Thirty-five injured workers who were not involved in SOCSO's RTW programme and 6 Occupational Therapists from Malaysia National University Medical Centre were involved in this study. Chapter four presents the results of an investigation into the occupational functioning and its relationship with activity limitations and participation restrictions with the 35 injured workers who were not involved in RTW programme conducted by SOCSO. Chapter five focuses on the health status of 105 injured workers who were involved in RTW programme conducted by SOCSO. Chapter six presents the

occupational competency and its relationship with negative emotional states of 76 injured workers who were involved in RTW programme. The final study of the thesis presented in Chapter seven describes the experiences and expectations of different support obtained in RTW programme. There were 21 injured workers with different injury locations and phases of RTW programme involved in this study. Chapter eight summarises the results and an integrated discussion, implications, limitations, conclusions and suggestions for future research directions. In addition, it also outlines the recommendations concerning RTW guidelines and occupationally-based interventions.

Chapter 3 Reliability and validation properties of the Malaysian language version of the Occupational Self Assessment version 2.2 for injured workers with musculoskeletal disorders

Introduction to chapter

Murad M.S., Farnworth L., O'Brien L. (2011). Reliability and validation properties of the Malaysian language version of the Occupational Self Assessment version 2.2 for injured workers with musculoskeletal disorders. ***British Journal of Occupational Therapy, 74(5),*** **226-232.**

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This study aimed to test the reliability and validity of the translated Malaysian language version of the OSAv2.2. The translation process involved with two translation experts from the Institute of Bilingual Language, MARA University of Technology, and a panel of six occupational therapists from Malaysia National University Medical Centre and then with a sample of 35 injured workers with MSDs who were not currently involved with the SOCSO RTW programme. The number was limited as the total number in this group was only 56. The aim to use this particular group is to avoid repeated chances of getting same feedback with the targeted participants (attended SOCSO RTW programme) in the main study. The duration of the process to do data collection and analysis started from September to

November 2009. In this paper, the process of translation and examination of the Malaysian Language translation of OSA were described and discussed using standardised procedure. Reliability and validity test was the next step to test the Malaysian Language of OSA. Content-related validity was not attempted as the original English version OSA has been tested with wide range of different populations including an Asian population (Japanese). The final version of the translated Malay version of OSA as showed in Appendix III.

Monash University

Declaration for Thesis Chapter 3

Declaration by candidate
In the case of Chapter 3, the nature and extent of my contribution to the work was the following:

Nature of contribution	Extent of contribution (%)
Conceptualisation and design of the research, application of ethics, data collection, data analysis and interpretation of the results, wrote paper	80

The following co-authors contributed to the work. Co-authors who are students at Monash University must also indicate the extent of their contribution in percentage terms:

Name	Nature of contribution	Extent of contribution (%) for student co-authors only
Louise Farnworth	Application of ethics, reading, critique and providing feedback on drafts.	
Lisa O'Brien	Reading, critique and providing feedback on drafts.	

Candidate's Signature	[redacted]	**Date** 3/5/2012

Declaration by co-authors

The undersigned hereby certify that:

(1) the above declaration correctly reflects the nature and extent of the candidate's contribution to this work, and the nature of the contribution of each of the co-authors.
(2) they meet the criteria for authorship in that they have participated in the conception, execution, or interpretation, of at least that part of the publication in their field of expertise;
(3) they take public responsibility for their part of the publication, except for the responsible author who accepts overall responsibility for the publication;
(4) there are no other authors of the publication according to these criteria;
(5) potential conflicts of interest have been disclosed to (a) granting bodies, (b) the editor or publisher of journals or other publications, and (c) the head of the responsible academic unit; and
(6) the original data are stored at the following location(s) and will be held for at least five years from the date indicated below:

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Research

Reliability and validation properties of the Malaysian language version of the Occupational Self Assessment version 2.2 for injured workers with musculoskeletal disorders

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Key words:
Occupational Self Assessment, reliability and validity, Malaysian language, injured worker.

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Introduction: It has been difficult for occupational therapists in Asia to use occupational therapy assessments, such as the Occupational Self Assessment (OSA) version 2.2, that are not validated in the local language. This study aimed to produce and assess the psychometric properties of a Malaysian version of the 21-item OSA.

Method: The translation process involved the forward and back translation from the original English version into the Malaysian version, followed by field tests conducted with a small group of occupational therapists and workers to confirm the translation's equivalence and appropriateness. A total of 35 Malaysian injured workers with musculoskeletal disorders who were not involved in a return to work programme were assessed using the Malaysian version of the OSA. Twenty-three were reassessed 7-14 days later to determine test-retest reliability.

Results: The Malaysian version of the OSA showed acceptable reliability (internal consistency, corrected item correlation and test-retest reliability) and validity (convergent and discriminant validity).

Conclusion: The results suggest that the OSA is reliable and valid in assessing occupational functioning for injured Asian workers with musculoskeletal disorders.

Introduction

Return to work (RTW) for workers with musculoskeletal disorders (MSDs) due to work-related injury is often a long rehabilitation process, which Young et al (2005) divided into four main phases: off-work, work re-entry, maintenance and advancement. The end of each RTW phase marks the achievement of important milestones. These are, respectively, (1) the ability to attempt work re-entry, (2) the ability to perform satisfactorily in pre-injury or alternative duties, (3) the ability to maintain employment and (4) the ability to advance in one's career (Young et al 2005). There are several issues at the different phases that need to be addressed, specific to the level of functioning of the worker, such as personal factors of volition, habituation and skill/occupational performance (Baron and Littleton 1999, Kielhofner 2008). However, evaluation of the individual's abilities at each level requires the use of measurements that are valid and reliable, and also sensitive to change over time. While such instruments are available in countries such as North America, the United Kingdom and Australia, the Occupational Self Assessment (OSA), one of the Model of Human Occupation (Kielhofner 2008) assessments, has not been validated for use in Asian countries such as India and Malaysia.

The Malaysian context

The Malaysian RTW programme is a rehabilitation programme that was introduced by Social Security Organisations (SOCSO) for insured workers, in accordance with the Employees' Social Security Act 1969, Section 57(1). Malaysian citizens and permanent residents who are registered and contribute monthly to SOCSO are entitled to benefit from SOCSO's protection scheme if they are injured or disabled in the course of their employment, including workplace and commuting accidents and occupational diseases. Since 2007, SOCSO has adopted the biopsychosocial model in managing its insured workers, because there is evidence for its effectiveness in improving outcomes, managing costs and balancing the needs of key stakeholders involved in the RTW process (Arnetz et al 2003).

In Malaysia, workers who do not agree to participate in an RTW programme are classified as 'unmotivated' by the assessing SOCSO case manager. The reasons are usually multifactorial and may include personal reasons, such as financial burden, psychological and social issues, or an uncooperative attitude during the assessment process. Currently, those who are classified as 'unmotivated' are advised that the RTW programme remains open to them if they need RTW guidance, and they are linked into other professional assistance if there is a need. For example, if a person with an amputation does not want to return to work, SOCSO will still assist him or her in terms of prosthetics and orthotics referral.

As part of a broader project aimed at evaluating the impact of the RTW programme on workers in the four different rehabilitation phases, this study aimed to validate the OSA version 2.2 (Baron et al 2006) in a Malaysian population by examining its reliability (internal consistency, corrected item correlation and test-retest reliability) and validity (convergent and discriminant validity). Malaysia has a unique multiracial population comprising Malays, Chinese and Indians (PERKESO Malaysia 2008). They do, however, have a common language, thus affording the opportunity to test the assessment across a broad multicultural group using just one language translation. To date, the OSA has not been translated into or validated in the Malaysian language, although it has been translated into several other languages (Asgari and Kramer 2008, Kielhofner et al 2009). This research sought to address whether the OSA Malaysian version is valid and reliable enough to be used for injured workers with MSDs, considering that the country has a diverse population in ethnicity, culture and religion.

Literature review

The impact of MSDs can be very complex, and overall health recovery may take a long time, extending beyond the treatment and rehabilitation phase to the RTW phase. It often involves pain and dealing with psychological issues, such as anxiety, depression and stress (Jonsson 2000, Soares and Grossi 2000, Assante et al 2007, van den Heuvel et al 2007). It is also associated with the limitation of activities that may be specific to the disability, such as walking, standing, sitting and lifting (for workers with back pain) and reading, concentrating, driving and sleeping (Kuiper et al 1999, Karjalainen et al 2003, Schonstein et al 2003, Jansson and Bjorklund 2007). Additionally, people who return to work may continue to experience further impacts on their physical and mental health, as well as on their social role functioning (for example, breadwinner for their family). These restrictions are likely to have an impact upon their overall quality of life (Arnetz et al 2003, Lotters et al 2005, Westman et al 2006).

Personal and environmental factors also need to be taken into consideration because they are often key predictors of RTW in people with MSDs. Personal factors such as age, gender, education and type of employment may affect the recovery of overall health outcome, such as pain intensity, physical and mental health, work capacity and quality of life (Schonstein et al 2003, Jabar 2005, Mohd Nizam and Rampal 2005, Fagarasanu and Kumar 2006, Verhagen et al 2006, Alnaser 2007, Sjöström et al 2008). The overall health outcome has been proven to be effective by the recent studies in Sweden using the biopsychosocial model (Arnetz et al 2003, Westman et al 2006, Sjöström et al 2008). Environmental factors such as work hours, as well as physical and psychological workload at the workplace, can have a significant impact on the recovery process (Keough and Fisher 2001, van Vuuren et al 2007). People who are involved with the injured workers, such as employers, peers, family and health professionals, also play a key role in the success of rehabilitation efforts (van Vuuren et al 2007).

No studies have been conducted, however, in relation to specific personal factors of occupational functioning, such as skill/performance capacity, volition and habituation (Arnetz et al 2003, Westman et al 2006, Sjöström et al 2008). The study of these factors in a group of injured workers at different phases (off-work, work re-entry, maintenance and advancement) may assist therapists and case managers in their strategic planning for future treatment. These concepts are based on the Model of Human Occupation (MOHO), which contends that people achieve occupational adaptation when, over time, they feel able to fulfil personal and external tasks related to their occupational identity (Kielhofner 2008). In this study, MOHO's self-report OSA questionnaire (version 2.2) was used to understand the occupational competence of the injured worker with MSDs in a Malaysian context.

Kielhofner et al (2009) reported on a series of three studies that examined the measurement properties of the OSA, which resulted in improved internal validity, sensitivity and reliability. The latest study using Rasch measurement showed that the 21 items of the OSA had good internal validity and are valid measures of the unidimensional constructs of occupational competence and value; both four-point rating scales showed improved and consistent results in the person separation (increased sensitivity) with 90% accuracy, covering the range of disabilities from a variety of contexts (Kielhofner et al 2009).

The Malaysian SOCSO, in particular, has been chosen for the proposed study due to its adoption of the biopsychosocial model in managing health-related issues for its injured workers. Since its adoption in early 2007, there have been 260 participants involved in the RTW programme. According to SOCSO, of the 260 participants, 166 had succeeded in returning to work, 74 were still in the rehabilitation phase, and 20 were still undergoing medical treatment (PERKESO Malaysia 2008).

Aims of the study

In preparation for a major study concerning the review of the SOCSO RTW programme's effectiveness, this preliminary study aimed to assess the reliability and validity of the Malaysian translation of the OSA by field testing it, first with a panel of occupational therapists and then with a sample of injured workers with MSDs who were not currently involved with the SOCSO RTW programme.

Method

This study was approved by the Monash University Human Research Ethics Committee, and involved two main components: the development of the Malaysian OSA and the assessment of its psychometric properties on a sample of workers with MSDs.

Development of the OSA Malaysian version

The development of the Malaysian OSA involved a three-part process.

First, permission for translation was obtained from the MOHO Clearinghouse, with the agreement to publish the Malaysian OSA on the MOHO website. The translation process involved forward and back translation of an original English version of the OSA into the Malaysian language version by two translation experts from the Institute of Bilingual Language, MARA University of Technology, Malaysia. After reconciling the forward and back translations, both experts met to finalise sentence structure and to produce an accurate translation of the original English version.

Second, the next part of the translation process involved six occupational therapists with a mean work experience of 5.1 years (SD = 5.9), fluent in both English and the Malaysian language. They rated each item of the translated version using a five-point likert scale to indicate whether or not they agreed that the item was grammatically sound, and whether or not the terms used were correct and preserved the meaning and content of the original OSA. There was also a column for comments and recommendations.

Third, researchers analysed the reviewer ratings of the Malaysian OSA and subsequently modified the Malaysian language version according to recommendations and comments from the occupational therapists, before testing the Malaysian language version with five workers with MSDs. The workers were recruited from people attending University Kebangsaan Malaysia Medical Centre, Malaysia, who are not currently registered with SOCSO. The purpose was to identify any flaws in the test version of the Malaysian OSA that may have affected the comprehension of the respondents. After this testing, researchers embarked on the major validation study. At the end of the pilot study, researchers produced the Malaysian OSA (see Table 1).

Validation of the OSA Malaysian version

The second part of the study aimed to establish the psychometric properties of the Malaysian OSA. For this part of the study, a group of injured workers not currently involved in an RTW programme (n = 56) were identified from the SOCSO database as potential participants for the study. The reason for targeting those not involved in a SOCSO RTW programme was to test this tool on a similar group to those who will be involved in a larger future study by the first author. An official letter providing information in plain language was posted to them, with a stamped envelope to enable them to return the consent form to the researcher.

Participants who agreed to take part in the study were then sent a demographic data form and two copies of the Malaysian OSA, together with the self-report scales detailed in the *Instruments* section below. Participants were asked to complete and return one copy of the Malaysian OSA immediately, then to complete and return a second copy 7-14 days later to establish test-retest reliability.

Instruments

The OSA version 2.2 (Baron et al 2006) has 21 items regarding 'myself' in terms of occupational competence (that is, how well they do) and value (that is, how important it is to them) using a four-point rating. The concepts that make up the 21 items comprise the aspects of skills/occupational performance (11 items); habituation, including habits and roles (five items); and volition, including personal causation, values and interests (five items). For the purpose of this study, the researchers examined only the competency rating of the participants: '1' (I have a lot of problem doing this), '2' (I have some difficulty doing this), '3' (I do this well) and '4' (I do this extremely well). The other self-report questionnaires that were given to the participants for discriminant and convergent validity purposes were pain, measured on the 10 cm Visual Analogue Scale (VAS) (Salen et al 1994, Katz and Melzack 1999), the Health Surveillance Short Form SF-36 (Ware et al 1993) and the Depression, Anxiety, Stress Scale (DASS-21) (Lovibond and Lovibond 1995).

The pain VAS measures the participant's perception of pain intensity by marking a point on a horizontal line, 10 cm in length; the VAS score is determined by measuring in centimetres from the left hand end of the line to the point that the participant marks.

The SF-36 is a self-report to measure the overall health status. The questions are designed to understand the effects of the disorders or illnesses on activity limitation and participation restrictions. The domains of physical functioning,

Table 1. English and Malaysian-translated OSA items

1. Concentrating on my tasks	*Memberi tumpuan kepada tugasan*
2. Physically doing what I need to do	*Melakukan aktiviti fizikal*
3. Taking care of the place where I live	*Menguruskan tempat tinggal sendiri*
4. Taking care of myself	*Mengurus diri sendiri*
5. Taking care of others for whom I am responsible	*Boleh menguruskan tanggungan*
6. Getting where I need to go	*Boleh pergi ke tempat yang dikehendaki*
7. Managing my finances	*Menguruskan kewangan sendiri*
8. Managing my basic needs (food, medicine)	*Mengurus perkara asas untuk keperluan sendiri (makanan, ubat-ubatan)*
9. Expressing myself to others	*Meluahkan perasaan diri sendiri kepada orang lain*
10. Getting along with others	*Boleh menjalinkan hubungan dengan orang lain*
11. Identifying and solving problems	*Mengenal pasti dan menyelesaikan masalah*
12. Relaxing and enjoying myself	*Bertenang dan menggembirakan diri sendiri*
13. Getting done what I need to do	*Menyelesaikan perkara yang sepatutnya saya buat*
14. Having a satisfying routine	*Kepuasan terhadap rutin harian*
15. Handling my responsibilities	*Menguruskan perkara yang berada di bawah tanggungjawab saya*
16. Being involved as a student, worker, volunteer, and/or family member	*Boleh melibatkan diri samada sebagai pelajar, pekerja, sukarelawan, atau ahli keluarga*
17. Doing activities I like	*Melakukan aktiviti yang digemari*
18. Working towards my goals	*Berusaha kearah matlamat yang saya tetapkan*
19. Making decisions based on what I think is important	*Membuat keputusan berdasarkan apa yang saya fikir penting*
20. Accomplishing what I set out to do	*Melaksanakan apa yang telah dirancangkan terlebih dahulu*
21. Effectively using my abilities	*Menggunakan keupayaan secara berkesan*

Domains of the above items: skill/occupational performance (item 1 to item 11); habituation (item 12 to item 16); volition (item 17 to item 21).

role emotional, role physical, vitality and mental health were deliberately chosen to measure their association with skill/occupational performance and habituation. Furthermore, the SF-36 has been translated into the Malaysian language and measured to ascertain its construct validity and reliability (Sararaks et al 2005).

The DASS-21 is a short version of the full DASS, which is a set of three self-report scales designed to measure the negative emotional states of depression, anxiety and stress. The DASS-21 has seven items for each of these scales and is translated and validated in the Malaysian language (Ramli et al 2007). The Malaysian Language DASS-21 had very good Cronbach's alpha values of 0.84, 0.74 and 0.79, for depression, anxiety and stress, respectively (Ramli et al 2007). The self-report measures issues pertaining to the psychology of the person, although DASS has a rigorous construct on chronic mental health issues such as depression, anxiety and stress.

Data analysis

For reliability, the internal consistency and test-retest reliability of the Malaysian OSA self-report was assessed at the item and total sum score. Cronbach's alpha coefficients were used for examining internal consistency, with a coefficient >0.70 considered adequate (Ware et al 1993). The intra-class correlation coefficient (ICC) was used to examine the test-retest reliability. An ICC value of >0.60 was considered the minimum acceptable (Anastasi 1998).

For validity, the convergent and discriminant validity of the Malaysian OSA self-report version were examined. Convergent validity was assessed by correlating the total sum score of the Malaysian OSA with similar constructs of the DASS-21 and the SF-36. Discriminant validity was assessed by the strength of the associations between the total sum score of the Malaysian OSA and pain intensity (as measured by the VAS), which reflects a different construct. The Spearman's rho correlation coefficient was used, and the interpretations were as follows: ≥0.75 indicating a strong relationship; 0.50 to 0.74, a moderate relationship; and ≤0.49, a weak relationship (Portney and Watkins 2000).

Results

Development of the OSA Malaysian version

The panel of occupational therapists reviewing the Malaysian OSA assigned either '4' (agree) or '5' (strongly agree) ratings to 13 out of the 21 items in the translated version. There were six items which received a '3' (neutral) and two items which received a '2' (disagreed) rating. The comments of the panel members indicated that the major concerns were with the clarity of the translations of the expression 'tasks', 'physically doing', 'taking care of others', 'getting where I need to go', 'getting done', 'satisfying routine', 'working towards my goal' and 'effectively' in the Malaysian language. These items were subsequently modified according to the suggestions by the occupational therapists and additional revision was made on these findings after it was tested with five workers with MSDs.

Validation of the OSA Malaysian version

Thirty-five participants agreed to take part in the study, as indicated by their consent form, and completed the initial OSA. Twenty-three supplied re-test data after 7-14 days, and 12 did

Table 2. Demographic data of participants who took part in the first and second evaluations

	First evaluation (n = 35)	Second evaluation (n = 23)
Gender, n (%)		
Male	21 (60.0)	13 (56.5)
Female	14 (40.0)	10 (43.5)
Age (year)		
Mean ± SD	40.8 ± 11.6	42.7 ± 11.3
Range	22-63	22-63
Education level, n (%)		
Primary school	2 (5.7)	0 (0)
Secondary school	24 (68.6)	16 (69.6)
Diploma	5 (14.3)	5 (21.7)
Degree	4 (11.4)	2 (8.7)
Ethnicity, n (%)		
Malay	21 (60.0)	15 (65.2)
Chinese	7 (20.0)	5 (21.7)
Indian	7 (20.0)	3 (13.0)
Location of the injury, n (%)		
Neck	3 (8.6)	3 (13.0)
Back	11 (31.4)	11 (47.8)
Shoulder	1 (2.9)	1 (4.3)
Upper limb	2 (5.7)	2 (8.7)
Lower limb	6 (17.1)	6 (26.1)
Medical status, n (%)		
On medical treatment	20 (57.8)	14 (60.9)
No medical treatment	15 (42.9)	9 (39.1)
Pain (on VAS)		
Mean ± SD	4.6 ± 1.8	4.6 ± 2.3
Range	0.2-8	0.2-8

VAS = Visual Analogue Scale.

Table 3. Total sum score of OSA, subscales DASS (stress, depression and anxiety), subscales SF-36 (vitality, physical functional, role emotional, role physical and mental health) and VAS (pain intensity) (n = 35)

Instruments		Mean (standard deviation)
OSA	Occupational competency	53.09 (10.38)
DASS-21	Stress	6.26 (4.78)
	Depression	4.57 (4.34)
	Anxiety	5.80 (4.93)
SF-36	Vitality	14.76 (3.47)
	Physical functioning	22.21 (10.46)
	Role emotional	10.41 (3.54)
	Role physical	12.94 (4.31)
	Mental health	19.91 (4.39)
VAS	Pain intensity	4.61 (1.84)

Table 4. Spearman's rho correlation coefficient for convergent validity of the Malaysian OSA (total sum score) with other instruments of VAS, DASS and SF-36

Instrument	Selected domain	Convergent[1] and discriminant[2] validity: Spearman's rho correlation	p-value
DASS-21	Stress[1]	-0.426	0.011
	Depression[1]	-0.398	0.018
	Anxiety[1]	-0.398	0.018
SF-36	Vitality[1]	0.314	0.071
	Physical functioning[1]	0.552	0.001
	Role emotional[1]	0.331	0.056
	Role physical[1]	0.461	0.006
	Mental health[1]	0.451	0.007
VAS	Pain intensity (10 cm)[2]	-0.191	0.271

not due to unavailability or lack of interest. There were no statistically significant differences in characteristics such as gender, age, ethnicity, location of injury, medical status, pain intensity and education level between the participants who completed the first and second evaluations. Malay ethnicity was the dominant group, the back was the most common location of injury, and most of the participants had completed secondary education level (see Table 2).

Reliability

Internal consistency

The Malaysian OSA showed high overall internal consistency, with a Cronbach's alpha coefficient of 0.91. All but four items demonstrated the corrected item-to-total correlation coefficients (between the respective item and the total sum score without the respective item) of >0.40. The four items were items 6, 7, 9 and 10, with the correlation coefficients ranging 0.33-0.39. However, the Cronbach's *alpha* coefficients (when the respective item is deleted) of all the items remained over 0.90, indicating that the four items with poor corrected item-to-total correlation had little impact on the internal consistency. Thus, the four items were suggested for the retention in the final version of the Malaysian OSA.

Test-retest reliability

Intra-class correlation (ICC) for all 21 items ranged from 0.41 to 0.84. Items 4 (0.57), 8 (0.41), 14 (0.56), 15 (0.59) and 21 (0.50) did not meet the minimum acceptable level of 0.60. In contrast, the ICC statistics of the total sum score between first (mean = 53.09, SD = 10.38) and second evaluation (mean = 55.28, SD = 11.42) was 0.87, exceeded minimum acceptable level of 0.60 and was significant ($p<0.01$).

Validity

Table 3 shows the descriptive scores of the total sum score of OSA (level of occupational competency), subscales DASS (stress, depression and anxiety), subscales SF-36 (vitality, physical functional, role emotional, role physical and mental health) and VAS (pain intensity) (n = 35). Table 4 shows

the convergent and discriminant validity, whereby the total sum scores of OSA of the Malaysian OSA and other instruments (DASS, SF-36 and VAS) are compared.

(a) Convergent validity

The vitality and role emotional of the SF-36 subscales had a weak and non-significant relationship to the OSA competence scale. In contrast, the mental health and role physical subscales of SF-36, together with the stress, anxiety and depression subscales of DASS-21, had a weak but significant relationship to the OSA competence scale. However, the physical functioning subscale of the SF-36 had a moderate and significant relationship to the OSA competence scale.

(b) Discriminant validity

Very low non-significant correlations were consistently found between pain intensity and the level of occupational competency (rho = -0.19, non-significant). Therefore, the Malaysian OSA is relatively independent of scores on the pain intensity VAS, indicating preliminary discriminant validity.

Discussion

The present study assessed the psychometric properties of the Malaysian OSA in a sample of injured Malaysian workers not currently participating in an RTW programme. It was found that high overall consistency and reasonable internal consistency of the corrected item correlation support the reliability of the Malaysian OSA in assessing the level of occupational functioning of the injured worker.

In terms of test-retest reliability, five items did not meet the minimum acceptable level of 0.60 and one item (8, 'Managing my basic needs [food, medicine]') was not significantly consistent. This may be expected because 42.9% of the participants had no further medical treatment. Malaysian culture could also contribute to this, particularly for men whereby managing basic needs is the role of the (female) spouse, next of kin or housemaid.

In this study, weak negative correlations were found between scores for the occupational competence scale and specific mental health issues, such as depression, anxiety and stress. This was expected, although there are some items in the OSA that are able to measure mental health status, such as item 19 (Making decisions based on what I think is important). However, it was not designed specifically to detect mental health status. The items focused on assessing the person's ability to adapt to changes in his or her occupational life through examining his or her values, interests and personal causation. On the other hand, mental health may not be the main issue with this group of injured workers as indicated by the DASS (stress, mean = 6.26, SD = 4.78; depression, mean = 4.57, SD = 4.34; and anxiety, mean = 5.80, SD = 4.93). However, the result of weak negative correlations may be related to the improvement of a person's occupational competency, thus decreasing any mental health issues.

There is also weak correlation between the OSA and the SF-36 subscales of vitality, role emotional and role physical. This is because the OSA assesses the person's ability to cope with his or her occupational performance, roles and daily routine. However, SF-36 subscales measure only the person's health indicators, such as energy, effort and participation in activities that involve friends and relatives/families.

The physical functioning subscale of SF-36 assessed 10 items of activity limitations, which comprised vigorous activities, such as lifting heavy objects and running, and moderate activities, such as moving a table, carrying groceries, climbing several stairs, bending, walking, dressing and bathing. It was found that participants' level of occupational competency was moderately correlated with physical functioning. This was expected because many of the items measured on the OSA are skill/performance based, such as items 2, 3, 4, 5 and 6 which involve performance in physical functioning. However, the OSA provides more information concerning measuring of the person's occupational performance, such as in item 6 (Getting where I need to go), which involves physical ability to commute or move from one place to another.

In this study, the results show that the level of occupational competency has a very weak negative relationship with pain intensity. This was also expected, because the OSA was not designed to detect pain. Moreover, the pain intensity that the injured workers reported was rather mild (mean = 4.60, SD = 1.80). The results of this study highlighted the importance of understanding the impact of health and health indicators on occupational performance.

Limitations of the study

This study had a limited number of participants, who may not reflect the general population of injured Malaysian workers, because they were drawn from a sample of those not currently engaged in an RTW programme. However, the preliminary data from this study will be used in planned future research by the first author in using the Malaysian OSA with a group of Malaysian workers with MSDs across the RTW phases.

Conclusion

The Malaysian OSA is reliable and valid for exploring the level of occupational functioning among injured workers with a variety of MSDs, and with people from different ethnic, cultural and religious backgrounds in a Malaysian context.

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Conflict of interest: None declared.

Key findings

- This study found that the finalised Malaysian language version of the OSA version 2.2, except the item relating to 'Managing my basic needs (food, medicine)', showed acceptable reliability (internal consistency, corrected item correlation and test-retest reliability) and validity (convergent and discriminant validity).

What the study has added

This study has provided the opportunity to explore the issues of occupational functioning among Malaysian workers with MSDs. The availability of a valid and reliable Malaysian OSA will assist occupational therapists in assessing and addressing biopsychosocial factors in Malaysian RTW programmes.

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Impact of the study

Murad M.S., Farnworth L., O'Brien L. (2011). Reliability and validation properties of the Malaysian language version of the Occupational Self Assessment version 2.2 for injured workers with musculoskeletal disorders. *British Journal of Occupational Therapy*, 74(5), 226-232

Journal metrics:

- Thomson Scientific ISI Web Knowledge Journal impact factor : Not available
- SCImago Journal and Country Rank (SJR):0.034 (2011)
- SCImago Journal Ranking:
    - Rehabilitation: Q3 (55th of 92)
- H Index: 26

As a result of this study, the availability of a valid and reliable Malaysian Language OSAv2.2 was available for use in the major study on Malaysian workers with MSD. This version of the Malaysian OSAv2.2 also will assist occupational therapists working in Malaysian return to work programmes to assess and therefore address injured workers biopsychosocial. Furthermore, Occupational Therapists who are currently working with adult clients are now able to explore the needs or problems of the clients by using the Malaysian Language of OSAv2.2.

So that occupational therapists are familiar with the translated version of the OSAv2.2, the first author has conducted two workshops on how to use the OSAv2.2 with 70 participants (occupational therapists) who were involved in RTW programme throughout Malaysia. One workshop was conducted by the Malaysian Ministry of Health at Putrajaya Hospital (Kuala Lumpur, 26-27 May 2011) and other by the Malaysian's Occupational Therapist Association conducted at Hospital Sultanah Bahiyah (Kedah, 13-14 November 2011). The translated

Malaysian Language of OSAv2.2 also has been acknowledged on MOHO clearinghouse webpage (http://www.uic.edu/depts/moho/mohorelatedrsrcs#Malaysian), where anyone interested with translated version can contact the first author **(Mohd Suleiman Murad:** [redacted]).

This study also has been presented internationally at multi-discipline professional or occupational therapists conferences and recently one of the proceedings has been published at Elsevier:

- Murad, M.S., Farnworth, L., and O'Brien, L. Translation, reliability and validation properties of Malaysian language version of the Occupational Self Assessment v2.2 for injured workers with musculoskeletal disorders. Presented at *The ACEBS©2010ASEAN Conference on Environment-Behaviour Studies Kuching, Sarawak, Malaysia 7-8 July 2010*
- Murad, MS., Farnworth, L., and O'Brien, L .Translation, reliability and validation properties of the Malaysian language version of the occupational self assessment version 2.2 for injured workers with musculoskeletal disorders. Presented at *The 5th Asia Pacific Occupation Therapy Congress (APOTC2011), The Empress Convention Centre on 19 – 24 November 2011, Chiang Mai, Thailand*
- Murad M.S., Farnworth L., O'Brien L. (2012). Psychometric Properties of Occupational Self-Assessment for Injured Workers with Musculoskeletal Disorders. *Procedia-Social and Behavioral Sciences, Elsevier*. 42, 507-517

Chapter three summary

In the previous chapter, the reliability and validity of Malaysian version of OSAv2.2 was demonstrated by examining its internal consistency and test-retest reliability (reliability), and

its divergent and discriminant validity by using the other self-reports of Health Surveillance (SF-36v2), Depression Anxiety and Stress Scale (DASS-21) and Visual Analogue Pain Scale (VAS).

Key findings were:

- This study found that the finalised Malaysian language version of the OSAv2.2 showed acceptable reliability,(internal consistency, corrected item correlation and test-retest reliability) except the item relating to 'Managing my basic needs (food, medicine)'and
- showed acceptable validity (convergent and discriminant validity).

In summary, the translation Malaysian OSAv2.2 is reliable and valid for exploring the level of occupational functioning among injured workers with a variety of MSDs, and with people from different ethnic, cultural and religious backgrounds in a Malaysian context.

Chapter 4 Occupational functioning of injured workers with musculoskeletal disorders and its relationships with activity limitations and participation restrictions.

Introduction to chapter

Murad M.S., O'Brien L., Farnworth L., Chien C. (submitted). Investigating the occupational functioning, activity limitations, and participation restrictions of Malaysian workers with musculoskeletal disorders not engaged in a Return to Work program. ***Occupational Therapy International (resubmission to journal waiting for final outcome)***

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This study aimed to explore perceived occupational competence of Malaysian workers with work-related musculoskeletal disorders (MSDs) and to see if this was associated with activity limitations and participation restrictions. Thirty-five participants out of 56 were purposely chosen to understand why they were not currently engaged in a Return to Work (RTW) programme participated in this study. In SOCSO, injured workers who do not agree to participate in the RTW programme are classified as 'unmotivated' although the reasons for their unwillingness to take part could be due to many factors. There may be personal reasons such as financial burdens, psychological and social issues, or an "uncooperative" attitude

during the SOCSO assessment process (pers. comm. with Mr. Edmund Cheong, case manager at the RTW Unit, SOCSO, April 2nd, 2009).

This research specifically focuses on these workers who chose not to participate in a RTW programme, to see if their current perceived occupational competence was a factor in their lack of engagement. However, these data provide only a baseline and need to be confirmed with control group in future. We also sought to explore the relationship between perceived occupational competence and activity limitations and participation restrictions. Specifically the aims of the study were: (1) to explore the level of perceived competence in occupational functioning in those workers not engaged in the RTW program (2) to identify the activity limitations and participation restrictions in this group, (3) to analyse whether factors such as gender, working, and medical status impacted on perceived occupational functioning, and (4) to analyse the relationship between occupational competence and activity limitations and participations.

Monash University

Declaration for Thesis Chapter 4

Declaration by candidate
In the case of Chapter 4, the nature and extent of my contribution to the work was the following:

Nature of contribution	Extent of contribution (%)
Conceptualisation and design of the research, application of ethics, data collection, data analysis and interpretation of the results, wrote paper	80

The following co-authors contributed to the work. Co-authors who are students at Monash University must also indicate the extent of their contribution in percentage terms:

Name	Nature of contribution	Extent of contribution (%) for student co-authors only
Louise Farnworth	Application of ethics, reading, critique and providing feedback on drafts	
Lisa O'Brien	Reading, critique and providing feedback on drafts.	
Chi-Wen Chien	Reading, critique and providing feedback on drafts.	

Candidate's Signature	[redacted]	Date 3/5/2012

Declaration by co-authors
The undersigned hereby certify that:

(1) the above declaration correctly reflects the nature and extent of the candidate's contribution to this work, and the nature of the contribution of each of the co-authors.
(2) they meet the criteria for authorship in that they have participated in the conception, execution, or interpretation, of at least that part of the publication in their field of expertise;
(3) they take public responsibility for their part of the publication, except for the responsible author who accepts overall responsibility for the publication;
(4) there are no other authors of the publication according to these criteria;
(5) potential conflicts of interest have been disclosed to (a) granting bodies, (b) the editor or publisher of journals or other publications, and (c) the head of the responsible academic unit; and
(6) the original data are stored at the following location(s) and will be held for at least five years from the date indicated below:

Location(s)	**Department of Occupational Therapy , School of Primary Health Care, Faculty of Medicine, Nursing and Health Sciences, Monash University (Peninsula Campus), Frankston, Victoria**

[Please note that the location(s) must be institutional in nature, and should be indicated here as a department, centre or institute, with specific campus identification where relevant.]

Signature 1	[redacted]	Date 3/5/2012
Signature 2		8/5/12
Signature 3		8/05/12

Investigating the occupational functioning, activity limitations, and participation restrictions of Malaysian workers with musculoskeletal disorders not engaged in a Return to Work program

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Abstract.

Objectives of study: This study aimed to explore perceived occupational competence of Malaysian workers with work-related musculoskeletal disorders (MSDs) and to see if this was associated with activity limitations and participation restrictions.

Methods: Thirty-five people who were not currently engaged in a Return to Work (RTW) program participated in this study. The Malaysian language questionnaires administered were the Occupational Self Assessment (OSA v2.2) and Health surveillance (SF-36 v2). Descriptive and inference analyses were used for data analysis.

Results: Mean occupational competence in our sample was found to be significantly lower than the reference population but there were no differences in our results based on gender, job status, or whether the person was still receiving medical treatment. Significant associations were found with most activity limitations measured by the SF-36 v2, with the strongest of these occurring with the item "bending, kneeling or stooping" (rho=0.64) and "carrying groceries" (rho=0.53). All participants rated the impact of their health problems on social activities as moderate to extreme.

Conclusions: There is support for case managers and occupational therapists to include an occupational functioning approach to engage injured workers in RTW programs.

Limitations and recommendations: This study had a small number of participants who may not reflect the general population of injured Malaysian workers.

Keywords: Occupational functioning, musculoskeletal disorders, activity limitations and participation restrictions

Introduction

Musculoskeletal disorders (MSDs) due to work-related injuries are becoming more common in industry, and are associated with the involvement of many healthcare professionals and rising claim-management costs (Bengt et al., 2003). Work-related MSDs may be the result of trauma or may develop over time and are caused either by the work itself or by the interaction between the employee and his/her working environment (Jonsson, 2000). Risk factors include carrying loads weighing more than 11.3 kilograms more than 25 times per day, or pulling and pushing materials (Kuiper et al., 1999). MSDs impact on individuals not only in terms of pain (Agnes et al., 2007; Jonsson, 2000; Soares & Grossi, 2000), but are also associated with limited physical ability and negative emotional states such as stress, anxiety and depression (Alexander et al., 2007; Jonsson, 2000; Soares & Grossi, 2000; Swenne et al., 2007). Personal beliefs about the injury and the impact this has on functional capacity are additional factors to be considered when dealing with injured workers with MSDs (Alexander et al., 2007).

In the 1990's, management approaches to workers with work-related MSDs have shifted from a medical to a bio-psychosocial orientation (Bengt et al., 2003; Sjostrom et al., 2008; Westman et al., 2006) . The ultimate objective for healthcare professionals and compensation providers is ensure injured workers with MSDs return to work (RTW) safely and quickly (Lai & Chan 2007; Pertubuhan Keselamatan Sosial Malaysia, 2008). In reality, however, RTW is not the only major outcome that concerns individuals and stakeholders (Baron & Littleton, 1999; Kielhofner, 2008; World Health Organization, 2001). The International Classification of Functioning, Disability, and Health (ICF) (World Health Organization, 2001) emphasizes the need to recognise the effects of MSDs on individuals' domain of activity limitations and participation restrictions, rather than focusing only on the impairment of body function and structure (World Health Organization, 2001).

This ICF focus resonates well with Occupational Therapy practice, in trying to understand how individuals manage their current occupational functioning (performance and participation) given the activity limitations and participation restrictions imposed on them by their injuries (Hemmingsson &

Jonsson, 2005; Kramer et al., 2008). Cromie et al. (2002) and Jansson and Bjorklund (2007) in descriptive studies have investigated the impact on injured workers' occupational functioning and its relationship to activity limitations and participation restrictions. Cromie et al. found that injured physiotherapists were reluctant to change their careers because they were in a state of shock or denial with their injuries. Previously they had experienced good health and no problems with safety, and therefore believed they were invincible to injuries through their expertise in protecting themselves. Jansson and Bjorklund found that workers who were off work but then attempted to return to work, experienced a change in their occupational functioning with certain role and activity restrictions. Furthermore, some of them experienced difficulties in adapting to the transition, especially when they had many roles and responsibilities.

It is important to understand how injured workers perceive their current occupational functioning, and to what extent this is linked to activity limitations and participation restrictions. It can be argued that these factors not only affect their quality of life, but may at the same time impact on their participation in any RTW program planned by compensation and healthcare providers (Bengt et al., 2003; Lotters et al., 2005; Westman et al., 2006).

In Malaysia, a national RTW program was implemented in 2008. This comprises a physical rehabilitation program for insured workers who have reduced functional capacity (Pertubuhan Keselamatan Sosial Malaysia, 2008). The primary purpose is to return the person back to his or her functional ability and former workplace and duties as soon as possible. Malaysia's Social Security Organisation (SOCSO) believes that by using a case management approach where a case manager is responsible for an individual case, the RTW can be managed professionally and systematically (Pertubuhan Keselamatan Sosial Malaysia, 2008). In SOCSO, injured workers who do not agree to participate in the RTW program are classified as 'unmotivated' although the reasons for their unwillingness to take part could be due to many factors. There may be personal reasons such as financial burdens, psychological and social issues, or an "uncooperative" attitude during the SOCSO assessment process (pers. comm. with Mr. Edmund Cheong, case manager at the RTW Unit, SOCSO, April 2nd, 2009).

This research specifically focuses on these workers who chose not to participate in a RTW program, to see if their current perceived occupational competence was a factor in their lack of engagement. We also sought to explore the relationship between perceived occupational competence and activity limitations and participation restrictions. Specifically the aims of the study were: (1) to explore the level of perceived competence in occupational functioning in those workers not engaged in the RTW program (2) to identify the activity limitations and participation restrictions in this group, (3) to analyse whether factors such as gender, working, and medical status impacted on perceived occupational functioning, and (4) to analyse the relationship between occupational competence and activity limitations and participations.

Methods

Research questions

The study addressed the following research questions:

1. Is overall occupational competence (as measured by the OSAv2.2) in injured Malaysian workers not engaged in a RTW program significantly different to normative scores?
2. Are there specific items on the OSA v2.2 which are particularly problematic for this group?
3. Are there any differences between the following subgroups: males/females, job/no job and treatment/no treatment?
4. What are activity limitations and participation restrictions (as measured by the SF-36v2) identified by this group?
5. Is occupational functioning (as measured by the OSAv2.2) related to activity limitations and participation restrictions (as measured by the SF-36v2)?

OSAv2.2, Occupational Self Assessment version 2.2

SF-36v2, Overall Health version 2

Participants

Workers with MSDs resulting from work-related accidents who were not engaged in a RTW program with SOCSO were selected to participate in this study. This group of injured workers was purposely chosen because we sought to understand whether perceived occupational competence was related to their lack of engagement.

Instrumentation

The self-report Occupational Self Assessment (OSA) version 2.2 (Baron et al., 2006), constructed using the MOHO model, was chosen for this study. The OSA includes 21 items regarding 'myself" in terms of occupational competence (that is, how well they do) and value (that is, how important it is to them) using a four–point rating. The concepts that make up the 21 items comprise aspects of skill/occupational performance (11 items), habituation, including habits and roles (5 items); and volition including personal causation, values, and interests (5 items). For the purpose of the study, the researchers only examined the occupational competence scores, which use four-point ratings that are: "1" (I have a lot of problems doing this), "2" (I have some difficulty doing this), "3" (I do this well), and "4" (I do this extremely well) as per the OSA manual (Baron et al., 2006). A study using Rasch measurement analysis demonstrated that the 21 OSA items (using the four-level rating scales) had good internal validity and could measure a single construct of occupational competence (Kielhofner et al., 2009). Furthermore, the OSA has been translated into the Malaysian language and been tested for its validity and reliability (Murad et al., 2011).

As well as the OSA, the self-report of SF-36 Overall Health version 2, constructed using the ICF model, was used (Hawthorne et al., 2007). The SF-36 is a self-report questionnaire to measure people's overall health status by understanding the effects of certain disorders or illnesses on activity limitations and participation restrictions (Ware et al., 1993). One of the sections on the SF-36 was purposely designed to measure activity limitations and participation restrictions. The 10 items for assessing activity limitation include vigorous (running, lifting heavy objects and participating in strenuous sports) and moderate (moving a table and pushing a vacuum, play bowling or playing golf, lifting or carrying the groceries) activities, lifting, climbing stairs (2 items), bending, walking (3

items), and bathing/dressing. The 2 items for assessing participation restrictions investigate the impact of physical health and emotional problems on engagement in normal social activities and visiting friends/relatives. These 12 questions were deliberately chosen for the purpose of this study, because people with MSDs are likely to be significantly affected in these areas (Cromie et al., 2002; Jansson & Bjorklund, 2007). Furthermore, the SF-36 has been translated into the Malaysian language and been confirmed as having construct validity and reliability (Sararaks et al., 2005).

Procedures

The study was approved by the relevant Human Research Ethics committee. A convenience sampling strategy was used in this study, where 56 workers with MSDs from work-related injuries were identified in the SOCSO database as potential participants. Inclusion criteria were: (1) current MSDs due to work-related injuries; (2) ability to read and understand the Malaysian language; and (3) no current involvement in a SOCSO RTW program. Initially, an official letter providing participation information was posted to potential participants with a stamped return envelope if they gave their consent to participate. After obtaining consent, the researchers sent out the demographic data form and the OSAv2.2 and SF36v2 self-reports. Participants were required to return all forms when completed. Reminders were sent 14 days after the forms and questionnaire were dispatched.

Data analysis

All data was analysed using SPSS 18 software and a two-sided p value <0.05 was considered statistically significant. Descriptive and frequency analyses were used to describe demographic variables such as age, gender, type of occupation, ethnicity, education level, location of injury, medical and working status. A similar analysis was used to explore the assessment results obtained from the OSA and SF-36 self-reports (total scale OSA mean scores, frequency and mean of each item). Subsequently, total scale mean OSA scores (for occupational competence) were compared to population means (mean=57.19, SD= 7.47) using one-sample t-tests. For the OSA, comparison population means were drawn from a study involving 542 participants (415 from the United States, 114 from Sweden, 10 from the United Kingdom, and 3 from Canada) with a mean age of 47.71 years

(range: 17-86) (Kielhofner et al., 2009). This reference group had a mixed disability/illness profile including no disability (25%) chronic medical condition (28%) neurological (12%) psychiatric (5.5%) physical (3%) and not stated (12.3%) (Kielhofner et al., 2009). Furthermore the Independent Samples Mann-Whitney U Test was employed to examine the differences in the total mean scores of OSA for two groups: male and female, working and not working, having treatment and no treatment. Finally, the Spearman's rho correlation coefficient was used to analyse how the total score for occupational functioning perceived competency correlated with items of activity limitations and participation restrictions. The interpretations for the strength of correlation are: ≥0.75, strong relationship; 0.50 to 0.74, moderate relationship; and ≤0.49, weak relationship (Portney & Watkins, 2000).

Results

Demographic data

Thirty-five participants agreed to participate in the study, representing a 63% response rate. The mean age of the participants is 40.8 years (SD=11.6, range=22-63). 57% indicated that they were on sick leave but had a job to go back to, with the remaining 43% unemployed due to losing their job as a result of their injuries. 57% were still undergoing medical treatment. Participants who were ethnic Malays comprised 60% of the sample, and the most common injury locations were the back and lower limbs. The majority of participants had a secondary school level of education. Detailed characteristics of the sample are presented in Table 1.

Table 1. Demographic data of participants

Sample characteristics	N(%)
Gender	
Male	21 (60.0)
Female	14 (40.0)
Education level, n (%)	
Primary school	2 (5.7)
Secondary school	24 (68.6)
Diploma	5 (14.3)
Degree	4 (11.4)
Ethnicity, n (%)	
Malay	21 (60.0)
Chinese	7 (20.0)
Indian	7 (20.0)
Location of the injury, n (%)	
Neck	5(14.3)
Back	12(34.3)
Upper Limb	6 (17.1)
Lower Limb	12 (34.3)
Current occupation, n (%)	
Factory worker	4(11.4)
Labourer	12(34.3)
Office worker	6 (17.1)
Technical worker	7(20.0)
Pensioner	2 (5.7)
Home duties	4(11.4)

Medical status	
(drugs and surgery), n (%)	
Receiving treatment	20 (57.1)
No treatment	15 (42.9)
Job status, n (%)	
On sick leave	20 (57.1)
No Job	15 (42.9)

Overview of the occupational competence of the participants

The total scale mean score of the participants' occupational competence was 53.09 with a standard deviation of 10.38. This was significantly lower when compared to the reference population means (mean=57.19, SD= 7.47) (p=0.025). Subsequently an analysis was done of the participants' occupational competence using the independent variables of gender, treatment and job status. The results demonstrated a non-significant difference between male and female workers (p=0.222), although females' mean score (50.71, SD=10.33) of occupational competence was somewhat lower than the males' (54.67, SD=10.35). Similar non-significant findings emerged with the group of participants who had a job (but were on sick leave) (mean=54.05, SD=11.38) and with those who no longer had a job (mean=51.80, SD=9.09) (p=0.458). There were also non-significant differences between participants still receiving medical treatment (medication and/or and surgery) (mean= 51.80, SD=9.99) and those who were not (mean=54.80, SD=10.98). In both the latter analyses, p= 0.330.

Occupational functioning across activities

The results of the OSA showed that the mode response for all but five test items was a rating of 3 (I do this well). For the remaining items, the mode response was a 2 (I have some difficulty doing this); these included item 2 (physically doing what I need to do [n=15, 43%]), item 3 (taking care of the place where I live [n=14, 40%]), item 6 (getting where I need to go [n=14, 40%]), item 17 (doing

activities I like [n=17, 49%]) and item 21 (effectively using my abilities [n=15, 42%]). Mean scores for each test item are shown in Table 2.

Activity limitations and participation restrictions

For the SF-36 v2, the mode response for four test items was a rating of 3 (not limited at all); these were climbing one flight of stairs, walking half a mile, walking 100 yards and bathing and dressing. More than half of respondents indicated that they were "limited a lot' in vigorous (running, lifting heavy objects and participating in strenuous sports) and moderate activities (moving a table and pushing a vacuum cleaner, play bowls or golf) with 49% selecting this response for "walking more than one mile" In terms of participation, the entire sample rated the impact on social activities as moderate to extreme. Furthermore, 43% of participants were limited some of the time from participating in their social activities (such as visiting friends, relatives, etc.) with a further 8.6% affected most or all of the time. Details of the frequencies and mean (standard deviation) of the activity limitations and participation restrictions are shown in Table 3.

Relationship of occupational competence with activity limitations and participation restrictions

There were significant low to moderate correlations ($0.37 \leq rho \leq 0.64$, $p < 0.05$) of total OSA competence scores with the items in activity limitations except for item 5 (climbing one flight of stairs) and item 10 (bathing and dressing). In addition, participation restrictions (item 11 and 12) showed low and non-significant correlations with total OSA competence. All results are presented in Table 4.

Discussion

The results of this study showed that the occupational functioning of Malaysian injured workers not engaged in a RTW program was likely to be lower than the reference population. This was expected since the participants had a different disability profile to that in the reference group. Interestingly, however, mean OSA competence scores for participants in this study (53.09) were slightly higher than

those found in a separate study by the authors (Murad et al., in press), measuring occupational competence in people engaged in a RTW program, whose mean score was 50.45.

We found no significant differences between males and females, groups who are still receiving treatment and those receiving no treatment, and those with a job to return to versus those who had lost their job. In this study, the domain of occupational functioning that was most strongly affected was occupational performance/skill. This involves the things that participants need to do physically, as well as taking care of the place where they live and getting where they need to go. Those items are important for adult workers who are in the process of returning to work, particularly those with additional family responsibilities (Baron & Littleton, 1999). The other domain of occupational functioning that was affected was volition, which means doing activities they like and using their abilities effectively. These findings showed objectively which specific occupational problems are experienced, compared to other previous descriptive studies which reported that due to MSDs injuries, injured workers experienced a change in their occupational functioning with restricted roles and activities (Cromie et al., 2002; Jansson & Bjorklund, 2007).

In this study, participants' experience with limitation of activities that required physical energy such as lifting, carrying groceries, climbing stairs, bending, kneeling stooping and walking more than a mile were very much affected. This was expected due to the location of injuries mostly located in the back (34%) and lower limb (34%). Previous studies have shown that workers with similar injuries experienced a greater impact on their physical functioning and a higher probability of permanent disability (Schoppen et al., 2002; Schoppen et al., 2001; Weiner et al., 2003). We also found that participants' involvement in such things as visiting relatives and social activities with their family was moderately to extremely affected. This may result in insufficient support from family and relatives, which has been shown to impact on engagement in RTW programs (Lysaght & Larmour, 2008).

In this study, we also found that perceived occupational competence and participants' activity limitations were moderately associated with activities that required physical energy such as lifting,

carrying groceries, climbing stairs, bending, kneeling, stooping and walking more than a mile. This was expected because many of the items measured on the OSA are skill /performance-based, such as items 2, 3, 4, 5 and 6 which involve performance in physical functioning (Baron et al., 2009). The OSA provided interesting information concerning the current occupational performance issues. The items rated lowest were: doing the things that they need to do physically, taking care of the place where they live and getting where they need to go. Those items reflect the responsibilities of a working adult, and need to be resolved before the individual can commit to a return to work program. Other items of occupational competence that are associated with activity limitations are doing activities they like and using their abilities effectively. This indicates that they still valued or expected to perform former physical activities that they used to do.

The findings provide therapists with the opportunity to explore other physical activities they are interested in or modify or adapt them so that they can do the physical activities they usually do in their daily life. Another explanation could be worker's own negative thoughts about their inability to return to former jobs or tasks due to their limited physical abilities. This is especially the case when they are unable to do vigorous and moderate activities and may affect his/her motivation and desire to return to work. In fact, in this study the majority of injured workers' occupations required physical energy such as labouring (34%) and technical work (20%). For those reasons such a person may lose a sense of self-efficacy and purposeful routine that he/she had valued throughout his or her working life.

It is evident that the issue of reduced occupational functioning and activity limitation in participants may represent a potential barrier to participating in the current RTW program. Therefore, the findings provide case managers and therapists with the opportunity to not overlook injured workers' current occupational competence when planning and offering a RTW program.

The present study has several limitations. First, it had a small number of participants who may not reflect the general population of injured Malaysian workers, as they were drawn from a sample not currently engaged in a RTW program. Second, this study was conducted in Malaysia and the results or lessons learned can only be applied in that country. More research involving cross-cultural

comparisons should be done in the future to make generalization of findings possible. Third, this study needs to recruit more participants who: have multiple injury location sites; are of Chinese and Indian ethnic descent; and various levels of education attainment. These groups of injured workers may exhibit more prominent or different occupational competencies and activity limitations. Finally, a cohort and qualitative study employing face-to-face interviews could be done to confirm the findings.

Conclusion

The present study provided preliminary findings that injured workers with MSDs experienced occupational dysfunction, activity limitations, and participation restrictions. Therefore, case managers and therapists, when dealing with injured workers, need to be aware of these barriers, instead of solely focusing on the pain, physical and psychological issues. Furthermore the injured workers who experienced activity limitations also presented with poor occupational functioning. The issue is taken into account comprehensively when participating in a return-to-work program. Future study is still needed to explore occupational functioning with a larger group of injured workers with MSDs who attend the RTW program in Malaysia or other countries.

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Table 2. The level of perceived competence, mean and significance in occupational functioning across activities (N=35)

Item	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Mean (SD)**
	N (%)	**N (%)**	**N (%)**	**N (%)**	
1. Concentrating on my tasks	5(14.3)	11(31.4)	14(40.0)*	5(14.3)	2.54 (0.92)
2. Physically doing what I need to do	8(22.9)	15(42.9)*	8(22.9)	4(11.4)	2.23 (0.94)
3. Taking care of the place where I live	5(14.3)	14(40.0)*	11(31.4)	5(14.3)	2.46 (0.92)
4. Taking care of myself	2(5.7)	7(20.0)	17(48.6)*	9(25.7)	2.94 (0.84)
5. Taking care of others					
for whom I am responsible	7(20.0)	10(28.6)	13(37.1)*	5(14.3)	2.46 (0 .98)
6. Getting where I need to go	7(20.0)	14(40.0)*	12(34.3)	4(11.4)	2.26 (0.90)
7. Managing my finances	8(22.9)	10(28.6)	13(37.1)*	5(14.3)	2.31 (0.80)
8. Managing my basic needs					
(food, medicine)	3(8.6)	10(28.6)	18(51.4)*	4(11.4)	2.66 (0.88)
9. Expressing myself to others	4(11.4)	10(28.6)	16(45.7)*	5(14.3)	2.63 (0.69)
10. Getting along with others	1(2.9)	5(14.3)	22(62.9)*	7(20.0)	3.00 (0.82)
11. Identifying and solving problems	4(11.4)	13(37.1)	15(42.9)*	3(8.6)	2.49 (0.85)
12. Relaxing and enjoying myself	2(5.7)	11(31.4)	18(51.4)*	4(11.4)	2.69 (0.76)

13. Getting done what I need to do	4(11.4)	9(25.7)	20(57.1)*	2(5.7)	2.57 (0.78)
14. Having a satisfying routine	2(5.7)	11(31.4)	18(51.4)*	4(11.4)	2.69 (0.76)
15. Handling my responsibilities	6(17.1)	11(31.4)	17(48.6)*	1(2.9)	2.37 (0.81)
16. Being involved as a student, worker, volunteer, and/or family member	6(17.1)	9(25.7)	17(48.6)*	3(8.6)	2.49 (0.89)
17. Doing activities I like	4(11.4)	17(48.6)*	10(28.6)	4(11.4)	2.40 (0.85)
18. Working towards my goals	4(11.4)	12(34.3)	19(54.3)*	0(0.0)	2.43 (0.70)
19. Making decisions based on what I think is important	3(8.6)	13(37.1)	17(48.6)*	2(5.7)	2.51 (0.74)
20. Accomplishing what I set out to do	2(5.7)	15(42.9)	16(45.7)*	2(5.7)	2.51 (0.70)
21. Effectively using my abilities	4(11.4)	15(42.9)*	12(34.3)	4(11.4)	2.46 (0.85)

Note: Item response Level 1: I have a lot of problems doing this, Level 2: I have some difficulty doing this, Level 3: I do this well and Level 4: I do this extremely well. Domain of the above item: Skill / Occupational performance (Item 1 to Item 11); Habituation (Item 12 to Item 16) ; Volition (Item 17 to Item 21)

(*) indicates the mode for each test item

Table 3. The frequencies, mean, and standard deviation of activity limitations and participation restrictions, (N=35)

Item(SF-36 selected items),n(%)	**1**	**2**	**3**	**4**	**5**	**Mean(S.D)**
Activity limitations						
1. Vigorous activities such as running, lifting heavy objects, participating in strenuous sports	24(68.6)*	7(20.0)	3(8.6)	-	-	1.38(0.65)
2. Moderate activities such as moving a table and pushing a vacuum cleaner, playing bowls or golf	19(54.3)*	9(25.9)	6(17.1)	-	-	1.62(0.78)
3. Lifting or carrying groceries	11(31.4)	16(45.7)*	7(20.0)	-	-	1.88(0.73)
4. Climbing several stairs	7(20.0)	14(40.0)*	13(37.1)	-	-	2.18(0.76)
5. Climbing one flight of stairs	5(14.3)	6(17.1)	23(65.7)*	-	-	2.53(0.75)
6. Bending, kneeling or stooping	10(28.6)	14(40)*	10(28.6)	-	-	2.00(0.78)
7. Walking more than a mile	17(48.6)*	6(17.1)	10(28.6)	-	-	2.71(5.42)
8. Walking half a mile	11(31.4)	9(25.7)	13(37.1)*	-	-	2.97(5.38)
9. Walking 100 yards	7(20.0)	7(20.0)	20(57.1)*	-	-	2.38(0.82)
10. Bathing and dressing	2(5.7)	11(31.4)	21(60.0)*	-	-	2.56(0.61)
Participation restrictions						

11. The extent that physical health or emotional problems have interfered with normal social activities (family, neighbours or groups)	0(0)	0(0)	12(34.3)	9(25.7)	13(37.1)*	4.03(0.87)
12. Time that physical health or emotional problems interfered with social activities (like visiting friends, relatives, etc)	1(2.9)	2(5.7)	15(42.9)*	8(22.9)	8(22.9)	3.59(1.02)

Note : Item 1 to 10 response (1 - Yes, limited a lot, 2 - Yes, limited a little, and 3 - No, not limited at all)

Note: Item 11 response (1 - Not at all, 2 – Slightly, 3 – Moderately, 4 - Quite a bit, and 5- Extremely)

Note: Item 12 response (1- All of the time, 2 - Most of the time, 3 - Some of the time, 4 - A little of the time, and 5 - None of the time)

(*) indicates the mode for each test item

Table 4. Details for the correlations and significance of overall mean score of perceived competence with activity limitations and participation restrictions.

Instrument	Selected domain/Item	Spearman's rho correlation	p-value
SF-36	**Activity limitations**		
	Vigorous activities such such as running, lifting heavy objects, participating in strenuous sports	0.57	<0.001
	Moderate activities such as moving a table and pushing a vacuum cleaner, playing bowls or golf	0.37	0.031
	Lifting or carrying groceries	0.53	0.001
	Climbing several stairs	0.41	0.015
	Climbing one flight of stairs	0.18	0.310
	Bending, kneeling or stooping	0.64	<0.001
	Walking more than a km	0.37	0.030
	Walking half a km	0.42	0.015
	Walking 100 meter	0.35	0.045
	Bathing and dressing	0.23	0.193
	Participation restrictions		
	The extent that physical health or emotional problems have interfered with normal social activities (family, neighbours or groups)	0.31	0.078
	Time that physical health or emotional problems interfered with social activities (like visiting friends, relatives, etc)	0.21	0.231

Impact of the study

Murad M.S., O'Brien L., Farnworth L., Chien C. (submitted). Investigating the occupational functioning, activity limitations, and participation restrictions of Malaysian workers with musculoskeletal disorders not engaged in a Return to Work program. ***Occupational Therapy International (resubmission to journal waiting for final outcome)***

Journal metrics:

- Thomson Scientific ISI Web Knowledge Journal impact factor : 0.526 (2011)
- SCImago Journal and Country Rank (SJR):0.0378 (2011)
- SCImago Journal Ranking :
    - Rehabilitation: Q2 (36th of 92)
- H Index: 17

Given that this study is yet to be published in a peer-reviewed journal, it is difficult to ascertain its impact. The actual findings of the study have been discussed and presented with the head of the SOCSO's Return to Work Unit case manager (Mr. Roshaimi) and other case managers prior to the cross-sectional survey which is the major study. After the publication has been accepted we plan to write a formal report to Board of SOCSO regarding the outcome of the study. The findings of the study also have been presented internationally at occupational therapists conferences:

Murad, M.S., Farnworth, L., O'Brien, L., & Chien C. The prevalence of occupational functioning, perceived competence measured through the Occupational Self Assessment and its association with pain, psychological symptoms, activity limitations and participation restrictions among injured workers with musculoskeletal disorders. Poster presented at the

"*OT Australia Victoria 2010 State Conference, Transitions & Transformation Developing Through Change, 12 & 13 November, MCG, Melbourne, Australia"*

Murad M.S., Farnworth L, O'Brien L, Chien C. Investigating occupational functioning of injured workers with musculoskeletal disorders and its relationships with pain, psychological symptoms, activity limitations and participation restrictions. Poster presented at the "*5th Asia Pacific Occupation Therapy Congress (APOTC2011), The Empress Convention Centre on 19 – 24 November 2011, Chiang Mai, Thailand"*

Chapter four summary

In the previous chapter, based on cross-sectional survey of the participants, their occupational competence was 53.09 with a standard deviation of 10.38. This was significantly lower when compared to the reference population means (mean=57.19, SD= 7.47) (p=0.025). In addition, the results demonstrated a non-significant difference between male and female workers (p=0.222), although females' mean score (50.71, SD=10.33) of occupational competence was somewhat lower than the males' (54.67, SD=10.35). Similar non-significant findings emerged with the group of participants who had a job (but were on sick leave) (mean=54.05, SD=11.38) and with those who no longer had a job (mean=51.80, SD=9.09) (p=0.458). There were also non-significant differences between participants still receiving medical treatment (medication and/or and surgery) (mean= 51.80, SD=9.99) and those who were not (mean=54.80, SD=10.98) (p= 0.330). The items of occupational competence that participants had some difficulty in performing are:

- item 2 (physically doing what I need to do (n=15, 43%)),
- item 3 (taking care of the place where I live (n=14, 40%)),

- item 6 (getting where I need to go (n=14, 40%)),
- item 17 (doing activities I like (n=17, 49%)) and
- item 21 (effectively using my abilities (n=15, 42%)).

More than half of participants indicated that they were “limited a lot’ in vigorous (running, lifting heavy objects and participating in strenuous sports) and moderate activities (moving a table and pushing a vacuum cleaner, play bowls or golf) with 49% selecting this response for “walking more than one mile” In terms of participation, the entire sample rated the impact on social activities as moderate to extreme. Furthermore, 43% of participants were limited some of the time from participating in their social activities (such as visiting friends, relatives, etc.) with a further 8.6% affected most or all of the time.

There were significant low to moderate correlations ($0.37 \leq rho \leq 0.64$, $p < 0.05$) of total OSA competence scores with the items in activity limitations except for item 5 (climbing one flight of stairs) and item 10 (bathing and dressing). In addition, participation restrictions (item 11 and 12) showed low and non-significant correlations with total OSAv2.2 competence scores.

Poster presented at Occupational Therapists Australia Victoria 2010 State Conference, Transitions & Transformation Developing Through Change, 12 & 13 November , MCG, Melbourne, Australia

The occupational functioning of Malaysian workers with musculoskeletal injuries

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Introduction and background

The prevalence of people with work related musculoskeletal disorders (MSDs) internationally is increasing. However, these workers' occupational functioning has not been investigated in relationship to pain, psychological symptoms, activity limitations and participation restrictions.

Injured workers with MSDs due to work related accidents from the Malaysian's Social Security Organisation (SOCSO) who were unmotivated to be involved in a return to work programme (RTW) were chosen to understand how these issues impacted on their functioning.

Objective

To explore the level of competency in occupational functioning using the Occupational Self Assessment (OSA, Baron et al., 2006) and its association with the pain, psychological symptoms, activity limitations and participation restrictions of workers with MSDs.

Design and participants

35 participants with work related MSDs were not part of the RTW programme that provided by SOCSO in Malaysia.

Valid and reliable Malaysian language questionnaires administered:

- Occupational self assessment (OSA v2.2)
- Visual Analogue Scale (VAS) for pain
- Health surveillance (SF36 v2)
- Depression, Anxiety and Stress Scale (DASS-21).

The data analysis used descriptive and frequency analyses including : One-Sample Kolmogorov-smirnov Test, Independent Samples Mann-Whitney U Test, and Spearman's rho correlation coefficient.

Table 1 Demographic data of subjects that participated in the study

Characteristics	subjects (n=35)
Gender, n (%)	
Male	21 (60.0)
Female	14 (40.0)
Age (year)	
Mean (±SD)	40.8 (±13.3)
Range	22 – 63
Education level, n (%)	
Primary school	2 (5.7)
Secondary school	24 (68.6)
Diploma	5 (14.3)
Degree	4 (11.4)
Ethnicity, n (%)	
Malay	21 (60.0)
Chinese	7 (20.0)
Indian	7 (20.0)
Location of the injury, n (%)	
Neck	3 (8.6)
Back	14 (40.0)
Shoulder	3 (8.6)
Upper Limb	2 (5.7)
Lower Limb	6 (17.1)

Results

Injured workers have some difficulty and problems in several items of occupational functioning. These OSA items are:

- *physically doing what I need to do* (n=15, 42.9 %)
- *taking care of the place where I live* (n=14, 40.0 %)
- *getting where I need to go* (n=14, 40.0 %)
- *doing activities I like* (n=17, 48.6 %)
- *effectively using my abilities* (n=15, 42.1%).

Female workers exhibited significantly more difficulty in *expressing self to others* than male workers (Female mean=2.2, SD(0.80), Male mean=2.90, SD(0.83), p = 0.03).

There were significantly low correlations with the DASS-21 in stress, anxiety, and depression subscales (-0.43 ≤ spearman's rho ≤ -0.40, $p < 0.05$).

There were statistically significant correlations with certain items of SF36 in activity limitations that required more energy and physical ability (0.53 ≤ spearman's rho ≤ 0.64, $p < 0.05$).

Non-significant correlations were found with pain intensity and the items in the participation restrictions, such as their normal social activities (family, neighbours or groups) and social activities (like visiting friends, relatives etc.) (-0.19 ≤ spearman's rho ≤ 0.31, non-significant).

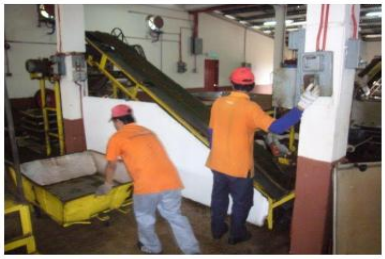

Table 2 The level of perceived competence, mean and significance occupational functioning across activities.

Item	n (%) 1	2	3	4	Mean (SD)	p-value
1. Concentrating on my tasks	5(14.3)	11(31.4)	14(40.0)	5(14.3)	2.54(0.92)	0.044
2. Physically doing what I need to do	8(22.9)	15(42.9)	8(22.9)	4(11.4)	2.23 (0.94)	0.023
3. Taking care of the place where I live	5(14.3)	14(40.0)	11(31.4)	5(14.3)	2.46 (0.92)	0.044
4. Taking care of myself	2(5.7)	7(20.0)	17(48.6)	9(25.7)	2.94 (0.84)	0.012
5. Taking care of others for whom I am responsible	7(20.0)	10(28.6)	13(37.1)	5(14.3)	2.46 (0.98)	0.059
6. Getting where I need to go	7(20.0)	14(40.0)	12(34.3)	4(11.4)	2.26 (0.86)	0.071
7. Managing my finances	8(22.9)	10(28.6)	13(37.1)	5(14.3)	2.31 (0.80)	0.016
8. Managing my basic needs (food, medicine)	3(8.6)	10(28.6)	18(51.4)	4(11.4)	2.68 (0.88)	0.005
9. Expressing myself to others	4(11.4)	10(28.6)	16(45.7)	5(14.3)	2.63 (0.89)	0.013
10. Getting along with others	1(2.9)	5(14.3)	22(62.9)	7(20.0)	3.00 (0.82)	0.001
11. Identifying and solving problems	4(11.4)	13(37.1)	15(42.9)	3(8.6)	2.49 (0.85)	0.026
12. Relaxing and enjoying myself	2(5.7)	11(31.4)	18(51.4)	4(11.4)	2.69 (0.76)	0.006
13. Getting done what I need to do	4(11.4)	9(25.7)	20(57.1)	2(5.7)	2.57 (0.78)	0.001
14. Having a satisfying routine	2(5.7)	11(31.4)	18(51.4)	4(11.4)	2.69 (0.76)	0.006
15. Handling my responsibilities	6(17.1)	11(31.4)	17(48.6)	1(2.9)	2.37 (0.81)	0.004
16. Being involved as a student, worker, volunteer, and/or family member	6(17.1)	9(25.7)	17(48.6)	3(8.6)	2.49 (0.89)	0.005
17. Doing activities I like	4(11.4)	17(48.6)	10(28.6)	4(11.4)	2.40 (0.85)	0.008
18. Working towards my goals	4(11.4)	12(34.3)	19(54.3)	0(0.0)	2.43 (0.70)	0.001
19. Making decisions based on what I think is important	8(8.6)	13(37.1)	17(48.6)	2(5.7)	2.31 (0.74)	0.008
20. Accomplishing what I set out to do	2(5.7)	15(42.9)	16(45.7)	2(5.7)	2.51 (0.70)	0.012
21. Effectively using my abilities	4(11.4)	15(42.9)	12(34.3)	4(11.4)	2.40 (0.83)	0.028

Note: 1= I have a lot of problems doing this, 2= I have some difficulty doing this, 3= I do this well, 4= I do this extremely well

Discussion

- OSA identified important occupational functioning issues for injured workers that required intervention.
- Personal factors such as gender needs to be taken into consideration in dealing with the occupational functioning issues.
- Activity that requires more energy and physical ability is related to difficulties and problems in workers' occupational functioning.
- In contrast, pain intensity, psychological symptoms and participation restrictions are not associated with occupational functioning. These need further investigation.

Recommendations

Case managers and occupational therapists need to include an occupational functioning approach to engage 'unmotivated' injured workers in the return to work programme.

Data will be used in future research to compare with a group of Malaysian workers with MSDs who were involved in the RTW programme.

Limitations

Small sample size may not reflect the general population of injured Malaysian workers, as they were drawn from a sample of those who did not want to be involved in the RTW programme.

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Go Boldly.

MONASH University
Medicine, Nursing and Health Sciences

Chapter 5 Health status of people with work-related musculoskeletal disorders in return to work programmes

Introduction to chapter

Murad M.S., Farnworth L., O'Brien L., Chien C. (in Press). Health status of people with work-related musculoskeletal disorders in return to work programs: A Malaysian study. *Occupational Therapy in Health Care*

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This study aimed to investigate injured Malaysian workers with MSDs at different RTW programme phases based on their abilities and capacities.

Specific objectives of this study were:

- to describe the health status of workers with MSDs who are participating in the Malaysian national RTW programme; and
- to measure injured workers self-reported health status (including physical and mental health components) across the four different RTW phases.

Evaluations of RTW programmes have to date focused on the workers' overall health status (pain, psychological factors, specific functional disabilities, and quality of life), environmental factors (working hours and psychological and physical workload), work disabilities (sick leave, compensation and service providers' costs), and success rates for returning to work. Most of these RTW outcomes were measured at 1, 2 or 5 years after those participants returned to work. These studies mostly focused on injured workers at two key stages: the off-work phase, or the return to work phase. One of the factors limiting the understanding of RTW following work disability is that those measurements do not illustrate a comprehensive picture of the workers' RTW experiences of their health status in the context of RTW processes (off-work, re-entry, maintenance and advancement). Thus, understanding their health status in the context of the RTW process will enlighten stakeholders on how to deal with it more effectively due to their involvement at different phases of RTW for example when injured workers at re-entry phase much involvement needed with the employer to facilitate the current health of injured workers. Furthermore, none of the above studies investigated the outcomes across the four different RTW program phases (Off-work, Work re-entry, Maintenance, and Advancement) as described by Young et al. (2008). The cross-sectional stratified survey was undertaken with 400 injured workers who attended the RTW programme conducted by SOCSO and only 105 of them returned back the survey questionnaires. The duration of the study was between September to December 2010. The Health surveillance of SF-36 self-report questionnaire was used to measure the health status. This study is important and timely to the current RTW programme that conducted by the SOCSO because they was no study being done to assess the current health status of injured workers when they attended RTW programme conducted by SOCSO.

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Monash University

Declaration for Thesis Chapter 5

Declaration by candidate
In the case of Chapter 5, the nature and extent of my contribution to the work was the following:

Nature of contribution	Extent of contribution (%)
Conceptualisation and design of the research, application of ethics, data collection, data analysis and interpretation of the results, wrote paper	80

The following co-authors contributed to the work. Co-authors who are students at Monash University must also indicate the extent of their contribution in percentage terms:

Name	Nature of contribution	Extent of contribution (%) for student co-authors only
Louise Farnworth	Application of ethics, reading, critique and providing feedback on drafts	
Lisa O'Brien	Reading, critique and providing feedback on drafts.	
Chi-Wen Chien	Reading, critique and providing feedback on drafts.	

Candidate's Signature	[redacted]	Date 3/5/2012

Declaration by co-authors
The undersigned hereby certify that:

(1) the above declaration correctly reflects the nature and extent of the candidate's contribution to this work, and the nature of the contribution of each of the co-authors.
(2) they meet the criteria for authorship in that they have participated in the conception, execution, or interpretation, of at least that part of the publication in their field of expertise;
(3) they take public responsibility for their part of the publication, except for the responsible author who accepts overall responsibility for the publication;
(4) there are no other authors of the publication according to these criteria;
(5) potential conflicts of interest have been disclosed to (a) granting bodies, (b) the editor or publisher of journals or other publications, and (c) the head of the responsible academic unit; and
(6) the original data are stored at the following location(s) and will be held for at least five years from the date indicated below:

Location(s)	**Department of Occupational Therapy , School of Primary Health Care, Faculty of Medicine, Nursing and Health Sciences, Monash University (Peninsula Campus), Frankston, Victoria**

[Please note that the location(s) must be institutional in nature, and should be indicated here as a department, centre or institute, with specific campus identification where relevant.]

Signature 1	[redacted]	Date 3/5/2012
Signature 2		8/5/12
Signature 3		8/05/12

Health status of people with work-related musculoskeletal disorders in return to work programs. A Malaysian study

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Abstract

This study examined the health status of injured workers with musculoskeletal disorders enrolled in the Malaysian's return to work program. The 102 participants were categorized into three Return to Work groups: off-work (n=30, 29.4%), work re-entry (n=44, 43.1%) and maintenance (n=28, 27.5%). Overall health status, as measured by the SF-36 version 2, of the workers exhibited below-average compared to the internationally-established normative population, with their physical health component summary rated lower than mental health. Across the different groups, significant differences were found in role-physical, vitality, bodily pain, general health, and mental health. However, the mean values of these variables were higher in the maintenance group and were found significant. The current health status of injured workers at off-work and re-entry phase was significantly low and warrant to be improved by involving other health professionals such as occupational therapists, ergonomists and psychologists.

Keywords: Health status, return to work, musculoskeletal disorders

Return to work (RTW) programs involve a multi-disciplinary approach with the aim to assist people with work-related musculoskeletal disorders (MSDs) in order to regain their working capacities. Equally importantly, another objective is to promote good health so that workers' overall quality of life and daily life roles improve. The rehabilitation process is often long, depending not only on the services provided but also the support from stakeholders, including the employer, peers, family members and the wider community (K. Karjalainen et al., 2003; K. A. Karjalainen et al., 2009). The number of health professionals involved in a RTW program varies, and each health professional plays a different but important role in managing MSDs. In particular, occupational health physicians, psychologists, physiotherapists, occupational therapists, ergonomists, and case managers are vital in managing workers with MSDs (K. A. Karjalainen et al., 2009; Lai & Chan, 2007; Lotters, Hogg-Johnson, & Burdoff, 2005; Westman et al., 2006).

It is important that research on people's workplace health is based on a conceptual framework, specifically the return to work disability phases (Krause, Frank, Dasinger, Sullivan, & Sinclair, 2001). Young et al., (2005) have defined four specific RTW phases based on injured workers' abilities and capacities (Young et al., 2005). These phases are: Off-work (defined as those who were unable to return work), Re-entry (those just returning to work with limitations), Maintenance (workers able to achieve their former productivity) and Advancement (workers able to advance their personal career development). Transition between phases is usually linear but can occur in a non-sequential way. Some injured workers may return to the initial RTW phase, moving forward step-by-step or starting at the more

advanced phases. Events that can influence progress are recurrent injuries, unforeseen disabilities, or environment related-factors.

Health status has recently become a major concern in outcome measures for people with MSDs. According to the World Health Organization (WHO), health is defined as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (World Health Organization, 2006, no. 2, page. 10). People with MSDs have significant variations in the extent and nature of impairments and functional limitations including psychological issues and physical restrictions in daily life activities that could further compromise their quality of life (Alexander, Brintnell, & Douglas, 2007; Bengt, Berit, Berit, & Roland, 2003; Cromie, Robertson, & Best, 2002; Heuvel, Ijmker, Blatter, & Korte, 2007; Jansson & Bjorklund, 2007; Jonsson, 2000; Kuiper, Burdorf, & Verbeek, 1999; Lotters et al., 2005; Soares & Grossi, 2000; Vuuren, Zinzen, Heerden, Becker, & Meeusen, 2007; Westman et al., 2006). Therefore, it is important that health status be explored from self-reported perspectives. It is important to note, however, that self-ratings of health status are dependent on a person's awareness and expectations about their health as well as health information and services available. Nonetheless their feedback will provide a base line for stakeholder and researcher to make policies and decisions based on their health status.

To date, evaluations of RTW programs have focused on the workers' overall health status (e.g., pain, psychological factors, specific functional disabilities, quality of life), environmental factors (e.g., working hours, psychological, physical workload), work disabilities (e.g., sick leave, compensation, service providers' costs) and success rates for returning to work (K. A. Karjalainen et al., 2009; Lai & Chan, 2007; Lotters et al., 2005; Westman et al., 2006). Most of these RTW outcomes were measured at one, two or five years after those participants returned to work (Bengt et al., 2003; Sjostrom, Alricsson, & Asplund, 2008; Westman et al., 2006), focused on injured workers at two key stages of the off-work

phase or the return to work phase. One of the factors limiting the understanding of RTW following work disability is that those measurements do not illustrate a comprehensive picture of the workers' RTW experiences of their health status in the context of RTW processes (i.e., off-work, re-entry, maintenance and advancement) (Wasiak et al., 2007). Thus understanding their health status in the context of the RTW process will enlighten stakeholders on how to deal with it more effectively due to their engagement in the process with the injured workers. Furthermore, none of the above studies investigated the outcomes across the four different RTW program phases as described by Young et al. (Young et al., 2005). Accordingly, there is no published report on these aspects of Malaysian workers' health status and the consequences of being involved in a RTW program.

The Malaysian context

In 2008, a bio-psychosocial RTW program based on similar programs developed in Australia, Canada, Sweden and the United States was introduced by the Social Security Organization (SOCSO) in Malaysia. Based on national policy, Malaysian citizens and permanent residents who are registered and contribute monthly to SOCSO are entitled to benefit from the protection scheme if they are injured or disabled in the course of their employment, including industrial or commuting accidents, and occupational diseases. In Malaysia, industrial and commuting accidents are considered to be employment related (Pertubuhan Keselamatan Sosial, 2012). Industrial accidents have been defined as accidents that occur while performing official duties in the work place (Pertubuhan Keselamatan Sosial, 2012). However, commuting accidents have been defined as accidents that happen while travelling; on a route between the place of residence and the work place, between the work place and the place where the employee takes meals during any authorized break and on a journey directly connected to work (Pertubuhan Keselamatan Sosial, 2012).

In 2009, SOCSO spent almost USD$219 million on temporary and permanent disablement benefits and invalidity pensions for injured workers. This cost represented a considerable increase from USD$187 million in 2008 (Pertubuhan Keselamatan Sosial Malaysia, 2008). According to the SOCSO annual report for 2009, the number of workers who have had more than 100 days sick leave was 51,107 between 1996 and 2009 (Pertubuhan Keselamatan Sosial Malaysia, 2010), with approximately 5,000 people accumulating sick leave of more than 100 days every year. The highest proportion (about one-third) of people with work-related injuries in 2009 was derived from the manufacturing sector (Pertubuhan Keselamatan Sosial Malaysia, 2010). This scenario emphasizes why the establishment of a RTW program was necessary in Malaysia. The Malaysian RTW program is coordinated by these case managers who are responsible for the referred case from the first day until the end of the process. The RTW rehabilitation program involves different disciplines but the process is not standardized and perhaps differs from one case to another, although multi-disciplinary approaches led and coordinated by case managers have been shown to improve work disabilities as well injured workers' health status (Bengt et al., 2003; Sjostrom et al., 2008; Westman et al., 2006). The main objectives of the SOCSO RTW program are to return injured workers to work safely and as soon as possible following rehabilitation, improve their quality of life, retain skilled workers in the workplace, and reduce compensation claim costs (Pertubuhan Keselamatan Sosial Malaysia, 2008).

Given the fact that the RTW program only began in early 2008, its impact on improving the health status of injured workers has not yet been explored. As it is important to provide empirical evidence for effective intervention based on the varying considerations of different stages or phases of injury and return-to-work, this study therefore aimed to measure the self-reported health status (including physical and mental health components) across the four different RTW phases. This study is only concerned with injured workers experiencing

employment-related accidents. Moreover, the injured workers being studied were off-work only due to industrial or commuting accidents.

Occupational therapy service delivery in Malaysia

There were six colleges that offer occupational therapy education both at degree and diploma level of which three from the government and another three from the private sectors (Pathar, 2012). Currently, there were 1,232 qualified occupational therapists working in hospitals under the Ministry of Health, 21 occupational therapists working in various welfare institutions under the Ministry of Welfare, 213 working in private hospitals/clinics and 107 working in educational sectors (Pathar, 2012). One of the challenges for the provision of occupational therapy services in Malaysia is that the majority of occupational therapists are working in the traditional hospital-based practice settings, not in community-based practice settings. This is due to limited numbers of qualified occupational therapists based on occupational therapist to population (Pathar, 2012). In 2010, with Malaysian population of 28.5 million, the occupational therapist ratio to population was 1:23,000 compare to developed countries such as UK (60,000 occupational therapist, ratio 1:1000) or Germany (60,000 occupational therapist, ratio 1:700) (Pathar, 2012; World Federation of Occupational Therapists, 2012) . In the future, Malaysia Occupational Therapists Association plans to have occupational therapy service delivery be in community base rehabilitation, community mobilization, rehabilitation centers (e.g.: drug abuse and detention center) and industrial rehabilitation (Pathar, 2012). This would be similar to occupational therapy services in other nearby countries such as Australia (e.g., in Victoria's WorkCover Authority's WorkSafe program), where occupational therapists play an important role in industrial rehabilitation (return to work) assisting injured workers having health problems with either physical and/or mental limitations. These programs offer consultation and advice in the risk management program and occupational rehabilitation team, and are conducted at the injured workers own

workplace. Although the reported outcome about the occupational therapy's role in RTW program was not specifically measured, one quasi-experimental pilot study from Hong Kong suggested that occupational therapists role in RTW program reduced sick leave and compensation costs significantly (Lai & Chan, 2007).

This study aimed to investigate injured Malaysian workers with MSDs at different RTW program phases based on their abilities and capacities.

Specifically, the objectives of this study were 1) to describe the health status of workers with MSDs who are participating in the Malaysian national RTW program; and 2) to measure the self-reported health status (including physical and mental health components) across the four different RTW phases.

Method

Participants

A randomized stratified sampling strategy, based on injured body part, was used to ensure that the sample for this study included representative ratios of workers with different disabilities. Inclusion criteria were: (1) a current work-related MSDs as diagnosed by physician; (2) ability to read and understand the Malaysian language; and (3) involvement in the SOCSO RTW program between 2008 and the end of 2010.

Four hundred potential participants were identified using a randomized computer sequence from SOCSO's RTW program database which included records for a total of 997 injured workers. These potential participants received an official letter providing participation information sheets and a stamped envelope to return their written consent for participation. Ethical approval was obtained from the Monash University Human Research Ethics Committee as well as the SOCSO prior to the study being conducted.

Design

A total of 105 participants agreed to take part in the study as indicated by their consent form. They then received the SF-36 version 2 questionnaire (Lai & Chan, 2007; Ware, Konsinki, & Keller, 1996) and a brief participant data survey that collected demographic, injury, treatment, and work-related information. In this survey, workers were also asked to categorize their current RTW status using the criteria described by Young et al., (2005) into one of the four phases (i.e., off-work, re-entry, maintenance, and advancement). This study was done by postal survey because participants were located around the country. This was a limitation that prevented the researcher from conducting a face-to-face identification of the phase. Therefore participants were asked to identify themselves by providing a complete and plain language explanation of the categorization (see Table 1).

Procedure

It was considered likely that some of the injured workers had experienced one or more phases of RTW, and some may have attempted a RTW but were now in the off-work phase due to recurrent or new injuries. Additionally, the duration of each phase in which the injured worker was in might differ from that of another injured person. For the purposes of this study, they were asked to choose one phase that best described their current RTW status. Once completed, participants were required to return all survey forms and questionnaires through the postal service. Telephone reminders were given at 14 days after the forms and questionnaires were sent.

Instruments

The SF-36 version 2 is a self-report questionnaire measuring the overall health status of people by understanding the effects of the disorders or illnesses on activity limitations and

participation restrictions. There are eight domains regarding physical and mental health, and each domain consists of 2−10 items that are related. The eight domains are physical functioning (10 items), role-physical (4 items), bodily-pain (2 items), general health (5 items), vitality (4 items), social functioning (2 items), role-emotional (3 items) and mental-health (5 items) (Ware et al., 1996). For each item, variations of a 3- to 6-point scale are used and a sum score can be calculated for each domain. In addition, a physical and mental summary is calculated. The physical component summary is comprised of physical functioning, role-physical, bodily-pain and general health domains while the mental component summary is comprised of vitality, social functioning, role-emotional and mental-health domains. The SF-36 version 2 has been culturally adapted and translated into the Malay language, and its validity and reliability are established (Sararaks et al., 2005).

Statistical analysis

The analysis of this study began by calculating the SF-36 version 2 domain scores of the total sample and the separate groups (classified by RTW phase). The mean domain scores for the total sample were compared to the average scores of an internationally established normative population by using one-sample t-test (SF-36v2™ Health Survey, 1998). The Shapiro-Wilk Test was used to test the normal distribution of all SF-36 version 2 scores (for all groups combined). Subsequently, for sub-group analysis concerning the separate RTW phases, normality of the data was also checked using the Shapiro–Wilk test (Bennett & Allen 1978, 2008). Results for separate groups were compared using one-way analysis of variance (ANOVA) for normally-distributed scores and Kruskal-Wallis Test for non-normally distributed scores. The Levene statistic was calculated prior to the ANOVA in order to examine the homogeneity of the SF-36 version 2 scores (Portney & Watkins, 2000). Post hoc examinations using Tukey HSD or Mann-Whitney U test were used to identify which pairs of variables exhibited significant differences. Tukey's test was used to protect Type I error

(Portney & Watkins, 2000). All statistical analyses were performed using SPSS version 18 software (i.e. SPSS Inc, Chicago, IL). A two-sided *p* value <0.05 was considered to be statistically significant.

Results

The 105 injured workers who participated were distributed across the different phases were: *Off-work* (n= 30, 28.6%), *Re-entry* (n= 44, 41.9%), *Maintenance* (n= 28, 26.7%), and *Advancement* (n=3, 2.8%). Since the *Advancement* group included only three participants, this phase was eliminated from the analysis due to low statistical power. The small size of this group is not surprising given that the SOCSO RTW program had been established only recently (Pertubuhan Keselamatan Sosial Malaysia, 2010).

The characteristics of the participants in this study are reported in Table 2. Overall, male participants with a Malay ethnicity constituted the dominant group with ages between 26-35 years. The most common location of injury was in the lower limb (31.4%). Physiotherapy (44.1%) was the main rehabilitation service provided and the majority of employees worked for large companies (44.1%). The main occupation groups were lorry/taxi drivers and dispatch riders (31.4%) and then factory workers (28.4%). The mean sick leave of the total participants was 207. 2 days (SD=208.2). Table 3 shows the details of the sick leave based on location of injuries and when they were at different phases of the RTW program.

Table 1. Descriptions used to assist participants in selection of their appropriate Return to Work phase (translated from Malay Language).

Return to Work phase	Descriptions
Off-work	You are off work due to your Musculoskeletal Disorders injuries. You are not at work at any time during this phase either in pre-injury or in an alternative capacity because you are still receiving medication and rehabilitation. During this phase, you are being assessed for functional abilities, employment-seeking behaviors and motivation to return to work.
Re-entry	You are just started back with work. You have been given a modified task, returned from time off, or are assuming a job that has different requirements in order to reduce your pain. While you are working, you may experience recurrent symptoms or disabilities (e.g., pain, restricted activity, physical and mental functioning limitations) which may cause you to take time off from normal working hours.
Maintenance	You are working at your previous capacity or ability. You are able to perform duties satisfactorily and are able to achieve productivity levels or goals over the long-term, and demonstrate potential for advancement.
Advancement	You are able to improve your work responsibilities and increase remuneration levels. You are able to further your personal career development. You may have been chosen to undertake educational programs and are pursuing short- and long-term career goals.

Table 2. Characteristics of participants at different phases in the study

	Total (N=102)	Phase 1 Off-work (n=30)	Phase 2 Re-entry (n=44)	Phase 3 Maintenance (n=28)
Gender, n (%)				
Male	84 (82.4)	25 (83.3)	33 (75.0)	26 (92.9)
Female	18 (17.6)	5 (16.7)	11 (25.0)	2 (7.1)
Age, n (%)				
18 to 25 years old	22 (21.6)	5 (16.7)	7 (15.9)	10(35.7)
26 to 35 years old	32 (31.4)	10 (33.3)	13 (29.5)	9(32.1)
36 to 45 years old	29 (28.4)	11 (36.7)	13 (29.5)	5 (17.9)
46 to 55 years old	17 (16.7)	3 (10.0)	11 (25.0)	3 (10.7)
56 years old and above	2 (2.0)	1 (3.3)	0 (0.0)	1 (3.6)
Ethnicity, n (%)				
Malay	57 (55.9)	15 (50.0)	26 (59.1)	16(57.1)
Chinese	17 (16.7)	5 (16.7)	8 (18.2)	4(14.3)
Indian	23 (22.5)	9 (30.0)	8 (18.2)	6(21.4)
Others	5 (4.9)	1 (3.3)	2 (4.5)	2 (7.1)
Location of the injury, n (%)				
Head	4 (3.9)	1 (3.3)	2 (4.5)	1 (3.6)
Neck	2 (2.0)	0 (0.0)	2 (4.5)	0 (0.0)
Trunk	25 (24.5)	7 (23.3)	12 (27.3)	6(21.4)
Upper Limb	19 (18.6)	7(23.3)	6 (13.6)	6(21.4)
Lower Limb	32 (31.4)	6 (20.0)	13 (29.5)	13 (46.4)
Multiple injuries	20 (19.6)	9 (30.0)	9 (20.4)	2 (7.1)
Type of services obtained, n (%)				
Medication or surgery	20 (19.6)	10 (33.3)	5 (11.4)	5 (17.9)

Physiotherapy	45 (44.1)	10 (33.3)	28 (63.6)	7 (25.0)
Occupational Therapy	3 (2.9)	2 (6.7)	1 (2.3)	0 (0.0)
Combination of the above	20 (19.6)	4 (13.3)	7 (15.9)	9 (32.1)
Not recognized				
Health Professionals	14 (13.7)	4(13.3)	3 (6.8)	7 (25.0)
(i.e. Traditional healers,				
Massagers)				
Type of occupation, n (%)				
Office work	15 (14.7)	3(10.0)	10 (22.7)	2 (7.1)
Laboring work	12 (11.8)	6 (20.0)	4 (9.1)	2 (7.1)
Technical work	14 (13.7)	4 (13.3)	4 (9.1)	6 (21.4)
Factory work	29 (28.4)	6 (20.0)	12 (27.3)	11(39.3)
Other	32 (31.4)	11 (36.7)	14 (31.8)	7 (25.0)
(e.g. Lorry drivers and dispatch riders)				
Type of employer, n (%)				
Small Company (less than 20 workers)	23 (22.5)	3 (10.0)	13 (29.5)	7 (25.0)
Medium-sized Company (21 to 50 workers)	26 (25.5)	10 (33.3)	9 (20.4)	7(25.0)
Large Company	45 (44.1)	11(36.7)	21(47.7)	13 (46.4)
(more than 50 workers)				
Other	8 (7.8)	6 (20.0)	1 (2.3)	1 (3.6)

Table3. Mean sick leave of the total participants and at three different phases

Location of injuries	n(Mean sick leave(SD))	Phase 1 Off-work	Phase 2 Re-entry	Phase 3 Maintenance
Head	4(326.3(276.6))	1(425.0(0.0))	2(108.0(101.8))	1(664(0))
Neck	2(85.0(63.6))	-	2(85.0(63.6))	-
Trunk	23(193.8(301.1))	7(364.1(494.1))	12(143.0(133.7))	4(48.0(68.9))
Upper Limb	19(185.5(175.2))	7(297.0(202.6))	6(109.5(84.6))	6(131.5(161.9))
Lower Limb	31(171.8(141.3))	5(244.2(278.9))	13(172.9(129.6))	3(142.8(63.81))
Multiple injuries	19(290.9(175.3))	8(363.4(136))	9(240.6(192.0))	2(227(236.9))
Total participants	98 (207.2(208.2))	28(327.9(286.9))	44(163.0(139.7))	26(152.2(151.1))

SF-36 sub-scales and physical/mental components summary

Table 4 shows the overall mean scores of the SF-36 version 2 sub-scales and summarizes the physical and mental components. All were found to be significantly lower than the international norms ($p < 0.001$) (SF-36v2™ Health Survey, 1998). The highest mean scores (i.e., better functioning) for this sample was in the vitality (VT) sub-scale. The mental health component summary mean scores were also slightly higher than the mean scores for the physical component summary. Subsequent analysis was made to test the normality of the mean scores. We found that all the SF-36 sub-scales and physical and mental component summary were normally distributed based on Shapiro-Wilk Test ($p > 0.05$) except for social functioning (SF), role emotion (RE) and mental health (MH).

Comparison of scores across the RTW program phases

Given that the physical functioning (PF), role physical (RP), bodily pain (BP), general health (GH), vitality (VT), physical component summary (PCS) and mental component summary (MCS) were normally distributed, parametric statistics were used for analysis**.** The Levene statistics indicated that the variances for each sub-scale were homogenous. A subsequent analysis using one-way ANOVA was thus used to compare the SF-36 version 2 results in the three phases of the RTW program. The results of the ANOVA found that four sub-scales (RP, BP, GH and VT) of the SF-36 version 2 exhibited significant differences between the groups based on the phase of the RTW program ($p < 0.05$). There were no significant differences between the other sub-scales (physical functioning) ($p > 0.05$). Furthermore, their physical and mental summary scores were found to have no significant variations among the different phases of the RTW program ($p > 0.05$).

Since the social functioning (SF), role of emotion (RE) and mental health (MH) were not normally distributed, the Kruskal-Wallis Test was used. Only MH was found to exhibit significant differences between the groups of injured workers at different phases of the RTW program ($p < 0.05$). There were no significant differences between the other 2 sub-scales (SF and RE) ($p > 0.05$). Details of the results of the ANOVA and Kruskal-Wallis tests are summarized in Table 5, and are also represented graphically in Figure 1.

Post Hoc Analysis

Pairwise analysis was done using the Tukey HSD. All the variables of role physical, bodily pain, general health and vitality were not significantly different when comparing the re-entry and off-work phase groups ($p > 0.05$). However, significant differences were found between the maintenance group and the other groups regarding the following measures ($p < 0.05$).

Specifically, Role Physical, General Health, and Vitality were significantly higher in the maintenance group than in the off-work group and Bodily Pain was significantly better in the maintenance group than the re-entry group

For the mental health domain, the Mann-Whitney U test identified significant differences between the off-work and maintenance phase groups, with the maintenance group scoring higher (p=0.012). Similar findings were evident as well with the re-entry and maintenance phase groups (p=0.011). In contrast, there were no significant differences when comparing the re-entry and off-work phase groups ($p > 0.05$). Similar findings with social functioning but when comparing the re-entry and maintenance phase groups there was a significant different (p=0.043). For role of emotion there were non-significant differences with either of the two phase groups ($p > 0.05$).

Table 4 Overall mean scores of the subscales and SF-36 physical and mental components summary

SF-36 subscale/ Component summary	Mean (SD)	*p*-value	95 % Confidence Interval
Physical functioning (PF)	35.68 (9.44)	<0.001	[-16.80 ;-11.85]
Role physical (RP)	36.12 (9.03)	<0.001	[-16.27 ;-11.50]
Bodily pain (BP)	35.67 (8.47)	<0.001	[-16.54 ; -12.12]
General health (GH)	40.26 (9.56)	<0.001	[-12.26 ;-7.21]
Vitality (VT)	43.38 (9.59)	<0.001	[-9.13 ;-4.11]
Social functioning (SF)	39.56 (9.75)	<0.001	[-13.00 ;-7.89]

Role of emotion (RE)	33.75 (12.12)	<0.001	[-19.44 ;-13.05]
Mental health (MH)	37.58 (10.87)	<0.001	[-15.27 ;-9.56]
PCS	37.77 (7.69)	<0.001	[-14.27 ;-10.19]
MCS	38.98 (11.11)	<0.001	[-13.96 ;-8.07]

Note:

PCS=Physical component summary, MCS=Mental component summary. Results are compared to norm-based scoring (each scale score mean =50.00 SD10) (SF-36v2™ Health Survey, 1998)

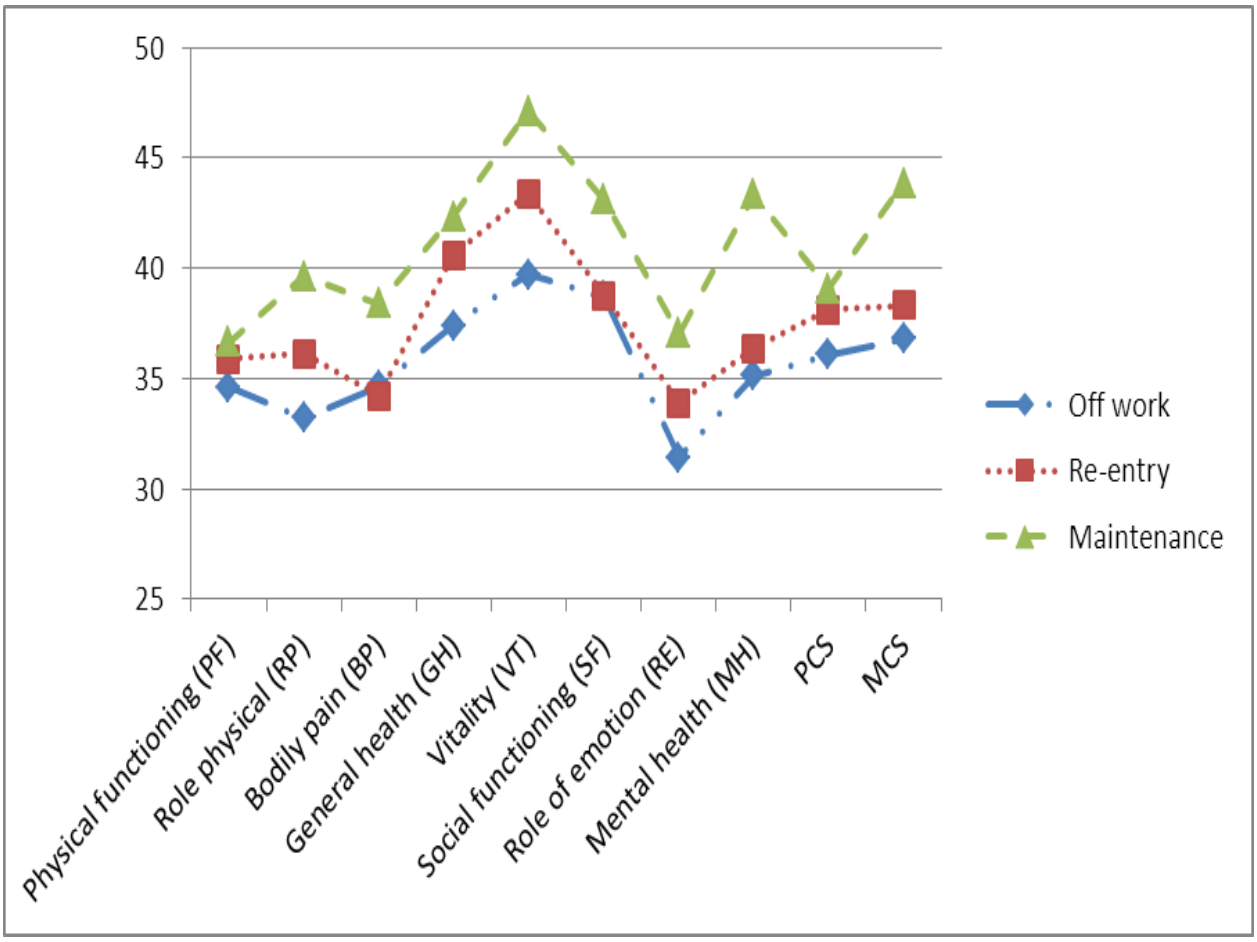

Figure 1: Graphic representation of mean SF-36 domain scores by RTW phase

PCS=Physical component summary, MCS=Mental component summary

Table 5. The differences in scores on the SF-36 sub-scales concerning groups of injured workers in three phases.

SF-36 Subscale/ Component summary	Phase Off-work Mean (SD)	Phase Re-entry Mean (SD)	Phase Maintenance Mean (SD)	Test statistic	*p*-value
Physical functioning (PF)	34.59 (10.25)	35.86 (8.48)	36.62 (10.23)	*F*=0.33	0.718
Role physical (RP)	33.20 (9.38)	36.11 (8.38)	39.63 (8.77)	*F*=3.65	0.030*
Bodily pain (BP)	34.66 (7.27)	34.22 (8.03)	38.40 (9.60)	*F*=3.14	0.048*
General health (GH)	37.40 (9.05)	40.60 (8.74)	42.32 (11.47)	*F*=3.12	0.049*
Vitality (VT)	39.72 (9.25)	43.38 (9.38)	47.12 (9.82)	*F*=4.35	0.016 *
Social functioning (SF)	38.72 (10.30)	38.76 (9.24)	43.08 (10.11)	*H*=4.23	0.121
Role of emotion (RE)	31.42 (12.74)	33.88 (12.85)	37.03 (10.38)	*H*=3.09	0.213
Mental health (MH)	35.12 (12.29)	36.37 (9.70)	43.34 (9.66)	*H*=8.37	0.015*

PCS	36.08 (8.34)	38.11 (6.66)	39.08 (9.08)	*F*=1.36	0.261
MCS	36.78 (11.67)	38.33 (11.09)	43.85 (9.99)	*F*= 2.90	0.060

Note; PCS=Physical component summary, MCS=Mental component summary, *F* indicates that the analysis was performed by one-way ANOVA, *H* indicates that the analysis was done using Kruskal-Wallis Test, (*) indicates $p < 0.05$

Discussion

Using a sample of Malaysian workers with MSDs engaged in the RTW program, this study is the first to investigate the differences in injured workers' health status across different phases. All of the SF-36 sub-scales and physical/mental summary components of the sample were below average compared to the internationally-established normative population with participants scoring their physical functioning lower than their mental functioning. This was expected as 75.5% of them had lower limb, trunk and multiple injuries, and previous studies have shown that workers with similar injuries experienced a greater impact on their physical functioning and a higher probability of permanent disability (Huijnen, Verbunt, Peters, & Seelen, 2010; Schoppen et al., 2002; Schoppen et al., 2001; Weiner et al., 2003). Furthermore, 73.5% of the sample had physically demanding jobs such as factory workers, lorry or taxi drivers and dispatch riders and technical workers. From these employment types requiring physical abilities, it is expected that their health status will be much more affected when they returned to work.

As this study included participants with industrial and commuting accidents, their mean sick leave period of 207 days (SD= 208) was rather long. When examined, injured workers with head injuries indicated the highest sick leave followed by multiple injuries, trunk, upper limb and lower limb although the large percentage of the location of injury was lower limb (31.4%) followed by trunk injuries (24.5%) , multiple injuries (19.6%), upper limb (18.6%), head (3.9%) and neck (2.0%). This study did not focus specifically on the injuries of the trunk such as low back pain or sciatica. The results were different from other studies which found that low back pain constituted the most prominent factor of sick leave among MSDs (Côté, Baldwin, Johnson, Frank, & Butler, 2008; Demmelmaier, Asenlof, Lindberg, & Denison, 2010). Additionally, the sick leave of injured workers in the advancement phase was lower compared to injured workers at re-entry and off-work phases.

Similar results occurred with the other specific location of injuries such as multiple injuries, trunk and lower limb injuries. This indicates that sick leave is one potential factor to be considered in the RTW process.

As expected, workers in the more advanced phases generally scored higher across all measures than those in the preceding phases, possibly reflecting recovery from injury over time. This may also be the result of the support and services provided or funded by SOCSO which reduced financial concerns during sick leave due to the payment of temporary disablement benefits (Pertubuhan Keselamatan Sosial Malaysia, 2010). Injured workers may also have received additional support from family, relatives, peers and employers when they returned to their workplace. Previous studies found that sick leave without financial and family, peer and employer support caused more stress, depression and anxiety among injured workers (Mussener, Festin, Upmark, & Alexanderson, 2008; Vuuren et al., 2007).

Greater attention to health status needs to be paid to injured workers in the off-work and re-entry phases. All except one score of SF-36 version 2 (bodily pain) were the lowest in the off-work phase, which was expected since the injured workers were most likely at their lowest ability and capacity, with 66.33% of them still receiving interventions such as surgery, medication and physiotherapy. Surprisingly, there were no significant differences in the health status of workers in the re-entry phase compared to those in the off-work phase, which may be explained by the long sick leave experienced by the injured workers. A few studies found that health status or well-being associated with sick leave and attention must be made on the workplace limitations (Boot, Koppes, Bossche, Anema, & Beek, 2011; Kuoppala, Lamminpaa, Vaananen-Tomppo, & Hinkka, 2011; Lötters, Foets, & Burdorf, 2011; Lotters et al., 2005). Workers may have faced obstacles at the workplace during re-entry phase due to limitation in their abilities and capacities which impacted perceived health status. It may also indicate that these services they obtained in the current RTW program were inadequate. With

only 2.3% received services from occupational therapists as compared to 63.6% had physiotherapy. Physiotherapy treatment primarily focuses on improving injured workers' pain and physical abilities (Schonstein, Kenny, Keating, & Koes, 2003), hence extra support is required from other healthcare professionals such as occupational therapists, ergonomists and psychologists in dealing with role-physical and mental health issues. Alternatively, perhaps the injured workers who were in the re-entry phase did not feel ready to work again, and perceived their health status as being no different from that of workers in the off-work phase.

Significant differences emerged when comparing the maintenance group with either the off-work or re-entry groups. This was expected because workers who had achieved their former work productivity were likely to have experienced some recovery in their health status. It was equally possible that the intervention/services provided by SOCSO while at work were sufficient to produce a good health status outcome. Specifically, 32.1% reported receiving a combination of services from physical therapy, occupational therapy or physician, 23% received services from physical therapy only, and 25% received services from non-health professionals.

Physical functioning (PF) and physical component summary did not show significant differences across the three phases of the RTW program in this study. It was expected since the participants involved in this study suffered physical injuries although the injuries located at different locations.

Participants did report that their PF was greatly affected, especially in the items requiring a high degree of mobility or manual handling. Seventy-one percent reported limitations with vigorous or moderate activity and walking more than 0.8 km. In addition, 38.4 to 51.0% injured workers reported having some limitation in terms of lifting or carrying

groceries, climbing several stairs, bending, kneeling, stooping and walking (91.4 km). Since the majority of participants were factory workers, lorry or taxi drivers and dispatch riders, they would experience an impact on their day-to-day functioning as their jobs involved greater physical demands, resulting in little differences in their PF. Such changes could be addressed by health professionals, such as occupational therapists or ergonomists, by providing such environmental adaptations or changes to work routines. There is evidence that this type of intervention in the RTW program can reduce the recurrence of injuries and restore injured workers' functional capacity and ability. This may help improve PF for injured workers (Bengt et al., 2003; Martimo et al., 2007; Verbeek et al., 2011; Verhagen et al., 2006).

Non-significant differences were reported for the social functioning (SF) of injured workers when they returned to work or achieved a maintenance standard. Social functioning is related to social activities as well as visiting family, friends and neighbors and must be taken into account as it affects their relationships. The results with two items (social activities and visiting) showed that 50 to 54% of participants reported that due to experiencing physical health or emotional problems their social functioning was moderately affected some of the time. This may be explained by having only limited time as they progressed due to the demands of their workplace necessitating more responsibilities. It could also perhaps be related to isolation or withdrawal as the result of their limited physical functioning. Therefore, the impact of SF status needs to be taken into account when considering the different phases of the RTW program.

Non-significant differences were also found for the role emotion (RE) sub-scale. Emotional problems, such as depression or anxiety, must be considered as it affects overall wellbeing of participants, either as workers or family members. In this group of injured workers, about a third (N=102) reported lower scores in two RE items, further confirming

that workers may be facing emotional problems when returning to work. The two items that affected were the time they had to do their regular daily activities was reduced and they were not doing their work as carefully as usual. Other studies also pointed out that fear of rejection, anger and isolation due to the inability to perform regular duties and leisure activities, were common psychological issues experienced by injured workers with MSDs (Cromie et al., 2002; Lydell, Baigi, Marklund, & Mansson, 2005).

Some global political and cultural issues could provide additional plausible reasons for non-significant differences of the PF, SF and RE sub-scales. For example, the employer may be involved only in a limited way and may have provided the worker with minimal modification or adaptation of their workplace or duties based on a worker's capacity and ability. Although Malaysia has several statutory Acts to assist with this, there are no guidelines and regulations that specifically focus on occupational rehabilitation management (i.e. management of the return to work process). This contrasts with countries such as Australia, where states have clear guidelines and been developed to regulate employers and health providers in dealing with injured workers who have RTW issues. For example, guidelines stipulate that, in a situation where a worker has sick leave (no current work capacity) for 20 or more calendar days, it is mandatory that the risk management program and an occupational rehabilitation team be established to plan strategically for the injured workers to return to work safely (Lotters et al., 2005; Victorian WorkCover Authority, July, 2010, June, 2005). The mean sick leave of the injured workers in this current study (207.2 days) was 10 times longer than the above guideline with those in the *Off-work* phase having a mean 327.89 sick days. Previous studies have demonstrated that the longer workers were away from work, the more likely they were to report psychological symptoms and poor self-image (Jansson & Bjorklund, 2007). Alternatively, the type of intervention may not have been optimized. Previous studies have shown that people with MSDs not only report physical but

also psychological symptoms and disturbances regarding occupational lifestyle issues (Agnes, Enrique, John, & Greet, 2007; Alexander et al., 2007; Cromie et al., 2002; Heuvel et al., 2007; Soares & Grossi, 2000). Engaging other healthcare providers earlier in the RTW phase would strengthen the RTW process. Management of stress, psychological support, occupational lifestyle modifications and workplace adaptation is the domain of healthcare professionals, for example occupational therapists, psychologists, counselors and ergonomists (Bengt et al., 2003; Sullivan, Feuerstein, Gatchel, Linton, & Pransky, 2005).

The results of this study have implications on occupational therapy practice delivery in Malaysia. Unfortunately, the current occupational therapy services delivery are focused more on primary health care services due to shortage of occupational therapists in Malaysia. This could be one of the potential reasons on why only few cases have been attended by the occupational therapists. Malaysian Occupational Therapists Association should plan strategically on how occupational therapy services can be delivered in industrial rehabilitation. One of the strategies could be by doing promotion and giving incentives to future occupational therapist graduates and stakeholders such as SOCSO. In general, these results may enlighten occupational therapist practitioners in other countries by explore and provide model of occupational therapy services in industrial rehabilitation.

Limitations

The present study had several limitations. First, the design of the study is cross-sectional and it did not track the same participants throughout their RTW journey. It is possible that the groups differed significantly from each other on variables not measured by this study. Future cohort studies are recommended to track participants across all phases and they could be analyzed with repeated measurement analyses that give much stronger results. In addition, by conducting face-to-face interview will eliminate participants' confusion regarding the

description of the RTW phases. Secondly, generalizability of the current study is limited since only a small proportion (10.5%) of participants was recruited from the entire population attending the SOCSO RTW program. Third, this study was conducted in Malaysia and the results can only be applied to this cultural and economic context. More research involving cross-cultural comparisons would be helpful in the future. Fourth, this study was unable to recruit a large enough sample of participants in the *Advancement* phase as the Malaysian RTW program has not been going long enough for people to reach this stage. Fifth, this study ignored the amount of time participants spent attending RTW programs due to not having a perfect sample attending the RTW program at the same time. Sixth, this study did not consider age and gender adjustments because this sample included a gender biased population at a wide age range. Finally, the SF-36 version 2 comprises information specific to functionality and wellbeing. Future studies are needed to explore other factors or outcomes, such as how well people are able to adjust or adapt to their new occupational lifestyle through modifications or adaptations in their routines, roles and activities across different phases of the RTW program. This can be done by using objective measurements such as Occupational Self Assessment version 2.2 (OSA) (Baron, Kielhofner, Iyenger, Goldhammer, & Wolenski, 2006) that has been translated and validated for Malaysian injured workers (Murad, Farnworth, & O'Brien, 2011).

Conclusion

Overall, the findings of this study indicate that SOCSO's RTW program coordinated by case managers may provide further opportunities for understanding the health status of injured workers across different phases of the RTW program. Greater attention is needed with injured workers who have the lowest and most limited capacities and abilities (off-work and re-entry phases). The findings suggest that involving multidisciplinary healthcare providers such as

occupational therapists, ergonomists and psychologists may be needed to ensure that injured workers experience improved health and can return to work. Furthermore, it is suggested that rules and guidelines regarding occupational rehabilitation management in Malaysia be further developed and enforced. This would lead to increased awareness of the importance of securing the full participation of injured workers, case managers, healthcare providers and employers.

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Impact of the study

Murad M.S., Farnworth L., O'Brien L., Chien C. (submitted). Health status of people with work-related musculoskeletal disorders in return to work programs: A Malaysian study. *Occupational Therapy in Health Care (accepted in Press, 11th April 2013WOHC-2012-0054.R2)*

Journal metrics:

- Thomson Scientific ISI Web Knowledge Journal impact factor : Not available
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  Rehabilitation: Q3 (59th of 92)

- H Index: 10

Given that this study is yet to be published in a peer-reviewed journal, it is difficult to ascertain its impact. The actual findings of the study showed that there are much needed to achieve a positive health status of the injured workers who are in the process of RTW, not only by the case managers and health providers but also the employers. We found that all the SF-36 sub-scales and physical/mental summary components of our sample were below average compared to the internationally-established normative population; with participants scoring their physical functioning lower than their mental functioning. As this study includes participants with industrial and commuting accidents, their mean sick leave period of was 207 days (SD= 208). When we examined this situation further, injured workers with head injuries indicated the highest sick leave days followed by workers with multiple injuries, trunk, upper limb and lower limb. The data indicates that greater attention needs to be paid to the health status of injured workers who were in the off-work and re-entry phases. All except one score of the SF-36 (bodily pain) were the lowest in the off-work phase, which was expected since

the injured workers were most likely at their lowest ability and capacity, with 66.33% of them still receiving interventions such as surgery, medication and physiotherapy. In addition, their physical functioning was lower than their mental functioning. As expected, workers in the more advanced phases generally scored higher across all measures than those in the preceding phases, possibly reflecting recovery from injury over time.

We were able to disseminate the findings to the health and safety practitioners such as case managers, employers and researchers at multi-professional conferences. A report has been developed to the board of SOCSO and Department of Occupational Safety and Health (DOSH), Malaysia regarding the findings, with recommendations on how to improve the health status of the injured workers in RTW by giving greater attention to injured workers who were in the off-work and re-entry phases. This study also has been presented locally and internationally at occupational therapy conferences as indicated below.

Murad M.S., Farnworth L., O'Brien L., Chien C. The impact of return to work programs on the health status of injured workers with work-related musculoskeletal disorders: a Malaysian study. Presented at the "*Scientific Conference on Occupational Safety and Health (SCI-COSH), 12 – 13 December 2011, NIOSH, Bandar Baru Bangi, Selangor, Malaysia"*

Murad MS, Farnworth L, O'Brien L, Chien C. The impact of return to work programs on the health status of injured workers with work-related musculoskeletal disorders. Presented at the *"5th Asia Pacific Occupation Therapy Congress (APOTC2011), The Empress Convention Centre on 19 – 24 November 2011, Chiang Mai, Thailand"*

Chapter five summary

In the previous chapter, research findings suggested that physical/mental summary components of the injured workers were below average compared to the internationally-established normative population; with injured workers scoring their physical functioning lower than their mental functioning. Furthermore, the findings demonstrate that those injured workers with the highest need are those who were in the off-work and re-entry phases. The findings suggest that involving additional multidisciplinary healthcare providers such as occupational therapists, ergonomists and psychologists may be needed to address specific issues related to psychological issues to ensure that injured workers experience comprehensive health care to be able to return to work. In addition, it is suggested that and policy guidelines regarding occupational rehabilitation management in Malaysia be further developed and enforced. This would lead to increased awareness of the importance of securing the full participation of injured workers, case managers, healthcare providers and employers in the return to work process.

Chapter 6 Occupational competence and its relationship to emotional health in injured workers in return to work programmes.

Introduction to chapter

Murad M.S., O'Brien L., Farnworth L., & Chien C. (2012). Occupational competence and its relationship to emotional health in injured workers in return to work programs: A Malaysian study. *Scandinavian Journal of Occupational Therapy.* Early online. 1-10

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This study aimed to measure the occupational competence and emotional states of workers with MSDs who were participating in Malaysia's national RTW program. Additionally, we aimed to examine any differences between groups of people in the different RTW phases, so that recommendations could be made regarding appropriate types of support or services. The relationship between occupational competence and negative emotional states in injured workers is, however, poorly understood due to limited supporting evidence. This cross-sectional stratified survey was conducted with 400 injured workers who attended a RTW programme conducted by SOCSO, with 76 returning back the survey questionnaires from between September to December 2010. The Malaysian OSA version 2.2 and DASS-21 were used. This study is important and timely as it investigates the current outcome of RTW programme conducted by the SOCSO.

Monash University

Declaration for Thesis Chapter 6

Declaration by candidate
In the case of Chapter 6, the nature and extent of my contribution to the work was the following:

Nature of contribution	Extent of contribution (%)
Conceptualisation and design of the research, application of ethics, data collection, data analysis and interpretation of the results, wrote paper	80

The following co-authors contributed to the work. Co-authors who are students at Monash University must also indicate the extent of their contribution in percentage terms:

Name	Nature of contribution	Extent of contribution (%) for student co-authors only
Louise Farnworth	Application of ethics, reading, critique and providing feedback on drafts	
Lisa O'Brien	Reading, critique and providing feedback on drafts.	
Chi-Wen Chien	Reading, critique and providing feedback on drafts.	

Candidate's Signature	[redacted]	**Date** 3/5/2012

Declaration by co-authors
The undersigned hereby certify that:

(1) the above declaration correctly reflects the nature and extent of the candidate's contribution to this work, and the nature of the contribution of each of the co-authors.
(2) they meet the criteria for authorship in that they have participated in the conception, execution, or interpretation, of at least that part of the publication in their field of expertise;
(3) they take public responsibility for their part of the publication, except for the responsible author who accepts overall responsibility for the publication;
(4) there are no other authors of the publication according to these criteria;
(5) potential conflicts of interest have been disclosed to (a) granting bodies, (b) the editor or publisher of journals or other publications, and (c) the head of the responsible academic unit; and
(6) the original data are stored at the following location(s) and will be held for at least five years from the date indicated below:

Location(s)	**Department of Occupational Therapy , School of Primary Health Care, Faculty of Medicine, Nursing and Health Sciences, Monash University (Peninsula Campus), Frankston, Victoria**

[Please note that the location(s) must be institutional in nature, and should be indicated here as a department, centre or institute, with specific campus identification where relevant.]

Signature 1	[redacted]	**Date** 3/5/2012
Signature 2		8/5/12
Signature 3		8/05/12

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ORIGINAL ARTICLE

Occupational competence and its relationship to emotional health in injured workers in return to work programs: A Malaysian study

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Abstract

Workers with musculoskeletal disorders undertaking Malaysia's return to work (RTW) programmes may experience challenges in occupational competence (OC) and negative emotional states (NES). This study aimed to measure and examines the OC and NES of the workers by comparing specific comparison groups and groups of different phases. A total of 76 participants were recruited from a national RTW programme and categorized into three groups based on different RTW phases: off-work ($n = 22$), re-entry ($n = 31$), and maintenance ($n = 23$). Self-report questionnaires consisted of the Occupational Self Assessment version 2.2 and the Depression, Anxiety and Stress Scale-21. Results showed that injured workers exhibited significantly lower OC in comparison with an international group with various disabilities. In contrast, there was significantly higher NES when compared with Malaysia's general population. Significant differences in OC and NES were also found between workers in the three RTW phases. In particular, OC and NES in the off-work and re-entry phases were significantly lower (OC) and higher (NES) than in the maintenance phase. Furthermore, there was a moderate, negative correlation between OC and NES in the off-work and re-entry phase groups. This indicated that low levels of perceived OC were associated with higher levels of NES.

Key words: *return to work, occupational competence, negative emotional states, musculoskeletal disorders*

Introduction

The overall health and well-being of workers who sustain physical injuries, either at work or whilst commuting to work, is often impacted. The World Health Organization (WHO) has recognized that damage to a person's body function and structure usually results in activity limitation (difficulty encountered by an individual in executing a task) and participation restriction (problems experienced by an individual while involved in various life situations) (1). Similarly, Kielhofner's Model of Human Occupation (MOHO) (2) argues that whenever people experience injury or disability, the consequences will impact on the person's volition (motivation, values, interests, and personal causation), habituation (daily routine, habits, and roles) and their performance capacity (2). Those components are interrelated and contribute to the individual's occupational performance and participation. The individual's competence and value regarding his/her occupational performance and participation are important because this will determine the success of return to work programmes. For instance, when an injured worker has recovered from injuries but is unable to return to former jobs or tasks, it may affect his/her motivation and desire to continue to work (3,4). Such a person may lose a sense of self-efficacy and purposeful

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routine that he/she had valued throughout his or her working life. Specifically, occupational competence is one's perception regarding his or her occupational performance and participation (4,5). On the other hand, occupational values are one's perception regarding what aspects of performance and participation are most important (4,5).

Emotional health derives from mental health; it is an individual positive emotional expression that signifies successful adaptation to a range of difficulties which enables an individual to function effectively within society (6,7). It also can be a negative state indicating unsuccessful adaptation to a range of difficulties (6,7). The emotional health of the injured worker is important to take into account when he or she is returning to work. For example, depression, stress, and anxiety are negative emotional states that can affect workers with musculoskeletal disorders (MSDs) who are away from work for a long time (8-10). The impact of negative emotional states is likely to be greater if the injured worker perceives that he/she has decreased capacity and ability (11,12). The relationship between occupational competence and negative emotional states in injured workers is, however, poorly understood due to limited supporting evidence.

Understanding these issues, especially across the different phases of the return to work (RTW) process, is also important because issues are likely to be varied depending on the phase the person is in. Young (13) described the RTW process in terms of four phases: (i) off-work, (ii) re-entry, (iii) maintenance, and (iv) advancement. Each phase represents the current injured employee's ability and capacity to work (13,14).

During the off-work phase, the injured worker at no time is able to return to work, whether to the original employment position, or in an alternative capacity and, in some cases, the person may be forced to opt for early retirement (13). Such injured workers may also be unable to competently perform their role as a spouse or family member and at the same time are unable to participate in leisure and meaningful activities. For example, one study found that injured workers who went through periods of depression were unable to do their former work duties (11). This phenomenon continued because they felt they could not generate any successful adaptive responses. These losses of occupational competence can lead to psychological distress such as fear of rejection, depression, anxiety, sleeplessness, anger, and isolation (15,16).

During the work re-entry phase, the injured worker cannot achieve his/her full ability and capacity (13). The worker recommences work at either the pre-injury workplace or an alternative workplace. However, the injured worker may face more problems due to overwhelming expectations from their peers, supervisor/manager, and employer (13). A recent qualitative study conducted in Sweden with 16 former unemployed sick absentees found that recently returned injured workers experienced a poor sense of self, a change in lifestyle, and restrictions in their roles and activities (17). They felt that their workplace's expectations failed to take into account the employee's changed capacity, and such workers expressed a tendency to become isolated. This isolation could last for long periods and most participants expressed the need for support to overcome these issues. Some participants also had not benefited from a prolonged break in their normal routine due to their injury or sickness while others had difficulty adjusting to a less active role, and this prevented them from maintaining their usual habits and routines (17).

In the maintenance phase, the worker is able to perform duties satisfactorily, can achieve goal productivity levels over the long term, and demonstrate his/her potential for advancement (13). The injured worker is likely to have adapted and is now coping with his/her occupational competence, particularly in connection with satisfaction and enjoyment of doing his/her jobs. However, the socio-cultural context and workplace scenario still need to be taken into account. The long-term psychological consequences due to MSDs can affect employment tenure and sustainability. One study (15) found that injured physiotherapists were reluctant to change their careers due to a state of shock or denial of their injuries because they had experienced good health and no problems with safety, and therefore believed they were invincible to injuries because they had expert knowledge about how to protect themselves.

In the advancement phase the worker may qualify for higher-level job tasks, be given more responsibilities, and gain promotion (13). The injured worker attempts to improve in areas of employment responsibility and remuneration levels, achieve completion of continuing education and career development programmes, and organize short- and long-term career goals (13,18). If this goes smoothly, then it is expected that no new problems will emerge concerning his/her occupational competence and emotional states.

In this study, we followed the description of MSDs which were under the International Classification of Diseases (ICD10) that classified those MSDs under Chapter XIII M99 due to biomechanical lesions that were not classified elsewhere for health management purposes and clinical use (19). The participant group were at the site of lesions: head region, neck region (cervical), trunk region (thoracic, lumbar, sacral, and pelvic), lower limb region (lower extremity), upper limb region (upper extremity), and multiple regions (more than one of the above regions).

This cross-sectional study aimed to measure the occupational competence and emotional states of

workers with MSDs who were participating in Malaysia's national RTW programme. Additionally, we aimed to examine any differences between groups of people in the different RTW phases, so that recommendations could be made regarding appropriate types of support or services.

Material and methods

The Malaysian context

Malaysia's compensation provider, known as the Social Security Organization (SOCSO), is regulated by the Employees' Social Security Act 1969, Section 57 (1). It is responsible for the welfare of the country's insured workers. Malaysian citizens and permanent residents who are registered and contribute monthly to SOCSO are entitled to SOCSO's protection scheme if they are injured or disabled during their employment, including workplace and commuting accidents and occupational diseases. SOCSO reported that in 2009 there were 34 376 (62.29%) of 55 186 cases involving industrial accidents and occupational diseases, while commuting accidents stood at 20 810 (37.71%) of 55 186 cases (20). One benefit that injured SOCSO workers have is the RTW programme, which is coordinated by the case manager. The RTW programme commenced in 2007, and was reviewed in 2009, at which time 1067 cases had entered the RTW programme. At this time, 744 had returned to work, 120 were looking for work, 101 were at the rehabilitation stage, and 102 were still receiving treatment (20). A recent report shows that up to December 2010, 2 518 workers had been treated and returned to work (21).

Participants

Workers with MSDs who were registered with Malaysia's national RTW service provider, SOCSO, were eligible for this study. It was approved by the relevant university Human Research Ethics Committee as well as SOCSO. To ensure that this study included a representative group, a randomized stratified sampling strategy based on the body part injured was utilized. In the SOCSO database, there were 997 workers with MSDs identified as potential participants. Inclusion criteria were: (i) current MSDs due to work-related injuries; (ii) ability to read and understand the Malay language; and (iii) involved in the SOCSO RTW programme between early 2008 and the end of 2010.

Instruments

As we were interested in measuring the individuals' perception of their occupational competence (occupational performance and participation) and value (which aspects of performance and participation are most important) we used the Occupational Self Assessment (OSA) version 2.2 (4,5). Understanding those issues is likely to facilitate a more client-centred intervention. The OSA self-report assessment (5) includes 21 items regarding "myself" for occupational competence (that is, how well they do) and value (that is, how important it is to them) which are rated using a four-level scale. The concepts that make up the 21 items comprise 11 items (related to skills/occupational performance), five habituation items (including habits and roles), and five volitional items (including personal causation, values, and interests). Key forms were used as instructed in the OSA manual (5): Occupational competence key forms rating: I do this extremely well = 4, I do this well = 3, I have some difficulty doing this = 2 and I have a lot of problems doing this = 1; Occupational value key forms rating: This is most important to me = 4, this is more important to me = 3, this is important to me = 2 and this is not so important to me = 1. If participants have not scored all items, the researcher can draw a line through the body of the key form, through the centre of the circled ratings (in the case of 1s and 4s) where a circle is drawn.

Kielhofner and colleagues reported on three studies that examined the measurement properties of the OSA, and this resulted in improved internal validity and reliability (22). The latest study using Rasch measurement analysis demonstrated that the 21 OSA items (using the four-level rating scales) had good internal validity and could measure a single construct of occupational competence (23). Furthermore, OSA has been translated into the Malay language and has been assessed for its reliability and validity in people with MSDs who did not attend SOCSO's RTW programme (24).

In addition to OSA, the Depression, Anxiety, Stress Scale of the DASS-21 was used. The DASS-21 – an abbreviated version of the complete DASS – is a set of three self-report scales designed to measure the negative emotional states of depression, anxiety, and stress. The DASS-21 has seven items for each of these scales and it has been translated into and validated in the Malay language (25). The DASS-21 Malay language had acceptable Cronbach's alpha values of 0.84, 0.74, and 0.79, for depression, anxiety, and stress, respectively. Additionally, it had good factor loading values for most items (0.39 to 0.73). Correlations among scales were between 0.54 and 0.68 (25).

Procedures

Initially, 400 potential participants with representative ratios of different musculoskeletal disabilities were contacted by post. The invitation letter included a

stamped return envelope to obtain consent for participation. Those who agreed to take part in this study were then sent the OSA 2.2 and DASS-21 self-report questionnaires. They were required to return these by post. In addition, participants were also asked to categorize their current RTW status by using the criteria adapted from Young (13) (see Appendix 1). Telephone reminders were undertaken 14 days later.

Data analysis

All data were analysed using SPSS 18 software and a two-sided p-value < 0.05 was considered statistically significant. Mean OSA 2.2 scores (for occupational competence and value), total score of the DASS-21, and sub-scales of stress, anxiety, and depression for the total sample were compared with population means using one-sample t-tests. For the OSA 2.2, population means were drawn from a study involving 542 participants (415 from the United States, 114 from Sweden, 10 from the United Kingdom, and 3 from Canada) with a mean age of 47.71 years (range: 17–86) (23). This reference group had a mixed disability/illness profile including no disability (25%), chronic medical condition (28%), neurological (12%), psychiatric (5.5%), physical (3%), and not stated (12.3%) (23). For the DASS-21, population means were from a group of 263 participants representing Malaysia's general population (25). The participants' ages ranged from 14 to 55 years. The subjects were selected from three government clinics in the Klang Valley area.

For sub-group analysis concerning the separate RTW phases, normality of the data was checked using the Shapiro–Wilk test. Comparisons were conducted using one-way ANOVA for normally distributed continuous variables, and the Kruskall–Wallis test for non-normally distributed data. Post hoc examination Tukey HSD or Mann–Whitney U-test were employed to identify which pairs of variables exhibited significant differences (off-work and re-entry, off-work and maintenance, re-entry and maintenance). In addition, the Spearman's *rho* correlation coefficient was used to investigate the relationship between the OSA competence and value scores, the total DASS-21, and DASS-21 subscales across each RTW phase. A correlation of ≥ 0.75 was considered to indicate a strong relationship; a score of 0.50 to 0.74 was deemed of moderate strength; and ≤ 0.49 a weak relationship (26).

Results

A total of 105 participants agreed to participate as indicated by their consent form but only 76 of them (19%, out of 400) completed the questionnaires. Researchers needed to drop 29 participants as they did not attempt to answer the questionnaires at all, or only attempted 2–5 items. The majority of the internal dropouts came from workers who had a background working as factory workers, despatch riders, and taxi or lorry drivers (22 out of 29). In addition, the majority of them were Malay ethnics (17 out of 29). The remaining 76 participants were further categorized into the different RTW phases. The numbers of participants across the RTW phases were: off-work (n = 22, 28.90%); re-entry (n = 31, 40.80%); maintenance (n = 23, 30.30%); and advancement (n = 0, 0.00%). Since the advancement phase had no participants, this group was discarded from further statistical analysis. This limited number in this group was expected given that the SOCSO RTW programme has been established relatively recently. Male participants from a Malay ethnic background made up the bulk of the sample in this study. The most common injury location was the lower limbs and the majority of participants were 26–35 years, working as taxi or lorry drivers or despatch riders and working for a large company. Most participants had received physiotherapy treatment. Their mean sick leave was 215.9 days. The participants' demographic details are presented in Table I.

Overview of the occupational competence/value and DASS-21 sub-scales

Table II gives the mean scores of the OSA 2.2 competence and value, total DASS, and three DASS sub-scales for all participants compared with the reference population means. Our study participants were found to have significantly lower OSA competence scores and significantly higher total DASS scores. Two of the DASS sub-scales (depression and anxiety) were also significantly higher in our sample ($p < 0.05$). There were non-significant differences regarding the OSA2.2 value and the DASS-21 stress sub-scale scores.

Comparison of results according to RTW phase

Mean scores on the OSA competence, total DASS, and its stress sub-scale were normally distributed and were analysed using one-way ANOVA. Scores for the OSA2.2 value and DASS-21 anxiety and depression sub-scales were not normally distributed, therefore non-parametric tests were used. For the OSA competence score, a significant difference emerged in the mean scores among the participants across three RTW phases ($F = 5.88$, $p = 0.004$) (Table III). Results from the Tukey HSD post hoc examination showed that the total OSA competence score (mean = 46.00, SD = 12.7) for the off-work group was not significantly different from that of the re-entry group

Table I. Demographic data of participants participating in the study.

Characters	Total (N=76)	Phase off-work (n=22)	Phase re-entry (n=31)	Phase Maintenance (n=23)
Gender, n (%):				
Male	63(82.9)	19(86.4)	23(74.2)	21(91.3)
Female	13(17.1)	3(13.6)	8(25.8)	2(8.7)
Age, n (%)				
18 – 25	16 (21.1)	3 (13.6)	4 (12.9)	9 (39.1)
26 – 35	25 (32.9)	7 (31.8)	11 (35.5)	7 (30.4)
36 – 45	22 (28.9)	9 (40.9)	9 (29.0)	4 (17.4)
46 – 55	11 (14.5)	2 (9.1)	7 (22.6)	2 (8.7)
56 years and above	2 (2.6)	1 (4.5)	0 (0.0)	1 (4.3)
Ethnicity, n (%)				
Malay	46 (60.5)	11 (50.0)	22 (71.0)	13 (56.5)
Chinese	12 (15.8)	4 (18.2)	4 (12.9)	4 (17.4)
Indian	14 (18.4)	6 (27.3)	4 (12.9)	4 (17.4)
Others	4 (5.3)	1 (4.5)	1 (3.2)	2 (8.7)
Location of the injury, n (%)				
Head	3 (3.90)	0 (0.0)	2 (6.5)	1 (4.3)
Trunk	18 (23.7)	4 (18.2)	9 (29.0)	5 (21.7)
Upper Limb	14 (18.4)	5 (22.7)	4 (12.9)	5 (21.7)
Lower Limb	26 (34.2)	5 (22.7)	10 (32.3)	11 (47.8)
Multiple injuries	15 (19.7)	8 (36.4)	6 (19.4)	1 (4.3)
Type of services received, n (%)				
Medication or surgery	9 (11.8)	5 (22.7)	3 (9.7)	1 (4.3)
Physiotherapy	37 (48.7)	9 (40.9)	21 (67.7)	7 (30.4)
Occupational Therapy	2 (2.6)	2 (9.1)	0 (0.0)	0 (0.0)
Combination of the above	17 (22.4)	4 (18.2)	5 (16.1)	8 (34.8)
Other healthcare	1 (14.5)	2 (9.1)	2 (6.5)	7 (30.4)
Practitioners (e.g Traditional				
Healers or masseur)				
Type of occupation, n (%)				
Office work	11 (14.5)	2 (9.1)	8 (25.8)	1 (4.3)
Labouring work	8 (10.5)	4 (18.2)	3 (9.7)	1 (4.3)
Technical work	12 (15.8)	4 (18.2)	3 (9.7)	5 (21.7)
Factory work	20 (26.3)	3 (13.6)	7 (22.6)	10 (43.5)
Other than the above(Taxi or lorry drivers, dispatch riders)	25 (32.9)	9 (40.9)	10 (32.3)	6 (26.1)
Type of employer, n (%)				
Small company(less than 20 workers)	18 (23.7)	2 (9.1)	10 (32.3)	6 (26.1)
Medium-sized company(21 – 50 workers)	20 (26.3)	8 (36.4)	7 (22.6)	5 (21.7)
Large company(more than 50 workers)	33 (43.4)	8 (36.4)	14 (45.2)	11 (47.8)
Other than above	5(6.6)	4(18.2)	0(0.0)	1(4.3)
Sick leave, days (mean, SD)	215.9(230.9)	371.1(323.2)	161.6 (145.9)	148.2(157.1)

Table II. Overall mean scores of the total OSA and subscales stress, anxiety, and depression.

Assessment scale (*n*)	Sample Mean (SD)	Comparison population Mean (SD)	*p*-value
OSA competence 76	50.45 (11.86)	57.19 (7.47)	< 0.001
OSA value 73	58.77 (12.39)	59.29 (8.16)	0.720
Total score DASS-21 75	21.35 (15.99)	16.5 (9.1)	0.011
Stress 75	8.19 (5.47)	7.40 (3.7)	0.217
Anxiety 75	6.84 (5.74)	5.0 (3.3)	0.029
Depression 74	6.45 (5.59)	4.2 (3.40)	< 0.001

Note: Results are analysed by using one sample *t*-test compared with published population means (23,25).

(mean = 48.84, SD = 10.49). However, in the maintenance phase, the total OSA competence score (mean = 56.87, SD = 10.45) emerged as significantly higher in comparison with the off-work (mean = 46.00, SD = 12.7) and re-entry phases (mean = 48.84, SD = 10.49) ($p < 0.05$). Similar results were also obtained with the analysis of the total DASS-21 and its stress sub-scale, where there were significant differences between three groups of RTW participants (Total DASS-21 ($F = 3.65$, $p = 0.031$), stress ($F = 4.06$, $p = 0.021$)) (see Table III). In the maintenance group particularly, the total DASS-21 and its sub-scale stress scores were significantly lower compared with re-entry phases ($p < 0.05$). For the OSA value scale and the DASS anxiety and depression sub-scales scores, the Kruskal–Wallis test showed non-significant differences across the three groups of participants.

Relationship between the OSA competence/value scales and DASS-21 sub-scales

For the whole sample, there was a low to moderate negative correlation between the total scores of the OSA competence and the total score DASS-21 and its three sub-scales ($-0.48 \geq$ rho ≥ -0.62, $n = 76$, $p < 0.01$); that is, low levels of perceived occupational competence were associated with higher levels of perceived negative emotional states. Similar results were obtained when investigating this issue based on three RTW phases (see Table IV). However, in the maintenance phase, the OSA competence score exhibited a low and non-significant correlation in relation to all DAS-21 subscales. For OSA value scores, there was a weak but significant correlation with the DASS-21 stress subscale for the total sample. All other correlations were non-significant.

Discussion

The perceived occupational competence of the total group participants in this study was found to be significantly lower when compared with the reference population, which comprised an international group with a mixed disability/illness profile (23). Similarly, their ratings of stress, anxiety, and depression were significantly higher when compared with Malaysia's general population (25). We also found that perceived occupational competence and stress, anxiety, and depression were moderately associated. Therefore,

Table III. Differences in scores on the total OSA and DASS-21 subscales between the group of injured workers in off-work phase, re-entry phase, and maintenance phase.

Scale	Phase: off-work Mean (SD)	Phase: re-entry Mean (SD)	Phase: maintenance Mean (SD)	Test statistic	*p*-value
OSA competence	46.00(12.70)	48.84(10.49)	56.87(10.45)	F = 5.88	0.004
OSA value	61.50(12.34)	58.97(11.15)	54.35(12.98)	H = 3.78	0.151
Total score DASS-21	23.45(16.57)	25.29 (17.67)	14.22(10.34)	F = 3.65	0.031
Stress	9.00(5.70)	954 (5.92)	5.61 (3.63)	F = 4.06	0.021
Depression	7.67(5.54)	8.00(6.59)	4.52 (3.91)	H = 4.19	0.123
Anxiety	7.15(5.75)	7.74(6.24)	4.09(3.65)	H = 5.02	0.081

Note; F indicates that the analysis was done using one-way ANOVA; H indicates that the analysis involved Kruskal–Wallis.

Table IV. Relationship between OSA competence and value scores and DASS-21 sub-scales across the different phases.

		DASS-21			
		Stress	Depression	Anxiety	Total
OSA2.2 Competence score	Total sample (n = 76)	–0.59**	–0.62**	–0.48**	–0.59**
	Off-work phase (n = 22)	–0.55**	–0.58**	–0.37	–0.48*
	Re-entry phase (n = 31)	–0.65**	–0.64**	–0.54*	–0.64**
	Maintenance phase (n = 23)	–0.31	–0.39	–0.23	–0.26
OSA 2.2. Value score	Total sample (n = 73)	0.27*	0.18	0.21	0.22
	Off-work phase (n = 22)	0.36	0.42	0.21	0.29
	Re-entry phase (n = 30)	0.06	–0.13	0.07	0.06
	Maintenance phase (n = 21)	0.28	0.24	0.24	0.26

Note: **Correlation is significant at the 0.01 level; *correlation is significant at the 0.05 level.

this study suggests that case managers and therapists must not overlook injured workers' occupational competence when they enter a RTW programme or overlook that they may have negative emotional states. Whilst we found a non-significant difference in the stress subscale of the DASS-21 between our sample and the Malaysian reference population, the total score and all other subscales indicated that our sample rated their anxiety and depression levels to be higher. Previous studies also found that higher levels of anxiety and depression can constitute a predictable factor when dealing with people with MSDs (27,28).

Lower occupational competence of the participants in the current study was expected since most of them (58%) had experienced lower limb or trunk injuries, which are associated with impaired mobility, and reduced sitting and standing tolerance (29-32). Many participants worked in physically demanding jobs such as factory labourers, lorry drivers, or dispatch riders. These conditions are also associated with lengthy periods of sick leave, and our sample's mean sick leave relating to the lower limb was 171.89 days (SD = 141.27) and for trunk injuries was 193.78 days (SD = 301.11). Very long sick leave can also emerge as a factor affecting workers' occupational competence and psychological well-being. For example, Jansson and Bjorklund in their descriptive study (17) concluded that injured workers who were on long-term sick leave (within three years) and unemployed experienced a change in their self-image, arguably due

Table V. Post-hoc analysis between two groups.

Pairwise phases	Negative emotional state	Test statistic	p-value
Off-work vs. re-entry	OSA competence	Tukey	0.634
	OSA value	Mann-Whitney	0.399
	Stress	Tukey	0.928
	Anxiety	Mann-Whitney	0.978
	Depression	Mann-Whitney	0.061
	Total DASS-21	Tukey	0.131
Re-entry vs. maintenance	OSA competence	Tukey	0.029
	OSA value	Mann-Whitney	0.213
	Stress	Tukey	0.041
	Anxiety	Mann-Whitney	0.022
	Depression	Mann-Whitney	0.085
	Total DASS-21	Tukey	0.030
Off-work vs. maintenance	OSA competence	Tukey	0.005
	OSA value	Mann-Whitney	0.165
	Stress	Tukey	0.081
	Anxiety	Mann-Whitney	0.081

to lower occupational competence and higher stress, anxiety, and depression (12).

In this study, workers who were in the off-work and re-entry phases may need greater attention to their occupational competence and psychological well-being. This study indicates that many injured workers returned to work even when they did not feel fully competent in their occupational performance and participation, and this was associated with symptoms of stress, anxiety, and depression. Whilst many participants indicated that they had received physiotherapy input (40.9% of those in the off-work phase, and 67.7% of those in the re-entry phase), there were not many other healthcare providers such as occupational therapists (OTs) and psychologists involved. This is possibly explained by the RTW programme focusing only on physical problems, such as pain and physical ability. We found that during off-work and re-entry phases injured workers perceived their occupational performance and participation to be greatly affected and reported higher levels of stress, anxiety, and depression, and this is consistent with previous studies (15-18). This study therefore highlights the need for early intervention in RTW programmes with regard to occupational performance and participation. In focusing primarily on physical issues, aspects of occupational competence and negative emotional states were possibly not identified by the case managers who were coordinating the RTW programme. It could be argued that it is necessary for occupational therapists (OTs) and psychologists to become involved in the off-work and re-entry phases. OTs are skilled in dealing with leisure, daily routines, and meaningful activities, while psychologists assist clients to manage symptoms of stress, anxiety, and depression. Previous studies have also found that the involvement of OTs and psychologists in the off-work and re-entry phases was important in returning workers to work (33,34).

Not surprisingly, injured workers' occupational competence scores were higher for those who had the ability to do more (i.e. those in the maintenance phase). In fact, their ratings of stress were also lower when they achieved their ability and productivity. There are a number of potential factors that may result in higher occupational competence and lower stress in the maintenance phase. Environmental factors include valuable support in the form of intervention from healthcare providers, i.e. a combination of medical/PT/OT (34.8%), physiotherapist (30.4%), and non-healthcare professionals (30.4%) was available in this study. Previous studies also found healthcare providers play important roles in providing or improving functional capacities and abilities, in negative mental states, and in quality of life of injured workers (33,35-37). It is possible as well that these workers had the support of their employer, particularly if they worked for a large company (43.4% of participants in this study). One study found that larger businesses are more likely to be able to afford to implement a system (policies and standard procedures in relation to disabilities management) that reduces the problems experienced by injured workers so that their occupational functioning does not deteriorate further, for example, by facilitating communication (i.e. reported injuries) and workplace accommodation (i.e. modified equipment and work tasks) (38). Another industry-based study found that support from co-workers and employers, by giving these individuals duties within their capacity that were able to sustain them at work, indirectly helped them emotionally (14). Alternatively, much of the support received by workers may have been provided by their peers, family, and community contacts. An exploratory study in Canada found that outside the workplace additional support was also important to the success of work re-entry, for example family and friends helping out with household responsibilities, providing home treatment (ice or heat packs), and driving employees to work and medical appointments (39). It is also possible that injured workers were simply able to better manage their condition by themselves.

We were interested to find that those in the maintenance phase rated their stress, anxiety, and depression lower than those in the other phases, since it could be argued that they were exposed to higher demands and expectations at work (e.g. productivity targets), and were less likely to be receiving intensive support from supervisors and employers. Our findings were, however, supported by previous studies which found that as long as the duties were within the workers' capacity and they felt supported by co-workers and employers, people were able to remain at work despite still experiencing symptoms such as pain (14,37). In addition, our results showed that the maintenance group's occupational competence and the DASS-21 subscales were only weakly related.

Limitations

The present study has several limitations. First, the current study included a sample of 76 participants who constituted a limited number (7.62%) of the total injured workers attending Malaysia's SOCSO RTW programme. Whilst every attempt was made to select a representative sample, we only received a return rate of 19% of the 400 people with MSDs initially contacted, and those that responded may not accurately reflect the complexity of issues faced by those returning to work. Moreover, the internal dropout analysis showed that the majority of them were factory workers

and despatch riders and taxi or lorry drivers. This group of workers typically have a low educational background and this could be a limitation in understanding and interpreting the questionnaires. For example, those who were illiterate in the Malay language would not have responded. In future, this issue could be addressed by incorporating a mixed method-approach with qualitative (and longitudinal) data and face-to-face explanation/interview. Additionally, the design of the study was cross-sectional (i.e. data were collected at one point in time), so it did not track the same participants throughout their RTW journey. It is possible that the groups differed significantly from each other on variables (causes and effects) not measured by this study. Future cohort studies are recommended to track participants across all phases and they could be analysed with repeated measurement analyses that give much stronger results. Other improvements would be further translation of OSA into different languages according to their preferred ethnic dialect (i.e. Tamil and Chinese language). Second, this study was conducted in Malaysia and the results can only be applied to that country. More research involving cross-cultural comparisons should be done in the future.

Conclusion

In conclusion, this study indicates that injured workers' occupational competence and negative emotional states need to be addressed, especially when they are in the off-work and re-entry phases, and participating in the RTW programme. Moreover, these employees' occupational competence and negative emotional states were moderately linked. The findings in this study verified those in other studies that indicated a relationship between these two variables (15-17,40). Those studies descriptively focused only on certain parts of occupational competence, such as an inability to perform duties and leisure activities in relation to depression/isolation. However, this study gives clear confirmation that occupational competence is an important issue affecting most injured workers. The study indicates that other health professionals, such as OTs and psychologists, should become involved at the beginning of the RTW programme in Malaysia. Injured workers' interests, roles, routines, and daily living skills should be focused on by service providers because their emotional and physical well-being are vital to their ability to function.

Further research, in the form of clinical trials for injured workers who are in the off-work and re-entry phases, should employ an occupational functioning approach so that the impact of interventions in the RTW programme can be documented, measured, and evaluated. Finally, more research is required concerning the extent of support offered by employers, peers, families, communities, and other agencies during the RTW process.

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Supplementary material available online

Appendix 1

Impact of the study

Murad M.S., O'Brien L., Farnworth L., Chien C. (2012). Occupational competence and its relationship to emotional health in injured workers in return to work programs. A Malaysian study. *Scandinavian Journal of Occupational Therapy.* Early Online, 1–10

Journal metrics:

- Thomson Scientific ISI Web Knowledge Journal impact factor : 1.070 (2011)
- SCImago Journal and Country Rank (SJR):0.561 (2011)
- SCImago (SJR) Journal Ranking:
    - Public Health, Environmental and Occupational Health : Q3 (186th of 335)
- H Index: 18

Given that this study is yet to be published hard copy in a peer-reviewed journal, it is difficult to ascertain its impact. The actual findings of the study indicate that injured workers' occupational competence and negative emotional states need to be addressed especially when they are in the off-work and re-entry phases, and participating in the RTW programme. Moreover, these employees' occupational competence and negative emotional states were moderately linked. The findings in this study verified those in other studies that indicated a relationship between these two variables. Those descriptive studies only focused on certain parts of occupational competence, such as an inability to perform duties and leisure activities in relation to depression/isolation. However, this study gives support that occupational competence is an important issue affecting most injured workers. In this study limitation of comparing international norms for reference group must be acknowledged. There were many possible confounding factors such as socio-economic and political systems .The study indicates that other health professionals, such as OTs and psychologists should become involved at the beginning of the RTW programme in Malaysia. Injured workers' interests,

roles, routines and daily living skills should be focused on by service providers because their emotional and physical well-being are vital to their ability to overall functioning.

The findings of this study have been presented locally and internationally at occupational therapy conferences as workshops and conference presentations. Here, we able to disseminate the information regarding the pattern or characteristics of the injured workers occupational functioning to occupational therapy practitioners and researchers. A report has been developed to the board of SOCSO and DOSH, Malaysia regarding the findings, and suggestion to improve the occupational functioning of the injured workers by giving greater attention to their occupational performance and participation with injured workers especially who were in the off-work and re-entry phases.

Murad M.S., Farnworth L, O'Brien L, Chien C. The occupational competence and its relationship with psychological symptoms among injured workers with work-related musculoskeletal disorders in return to work programme. Presented at *"The Functional Capacity Evaluation Workshop, Ministry of Health Malaysia, Hospital Putrajaya, Putrajaya. 26-27 May 2011"*

Murad MS, Farnworth L, O'Brien L, Chien C. The occupational competence and its relationship with psychological symptoms among injured workers with work-related musculoskeletal disorders in return to work programme. Presented at *"Return to Work Seminar, Malaysian Occupational Therapist Association, Hospital Sultanah Bahiah, Alor Star Kedah. 13-14 November 2011"*

Murad M.S., Farnworth L., O'Brien L., Chien C. The occupational competence and its relationship with psychological symptoms among injured workers with work-related musculoskeletal disorders in return to work programme. Presented at "*The 5th Asia Pacific*

Occupation Therapy Congress (APOTC2011).The Empress Convention Centre on 19 – 24 November 2011, Chiang Mai, Thailand"

Murad M.S., Farnworth L., O'Brien L., Chien C. Occupational competence and its relationship to psychological symptoms among injured workers with work-related musculoskeletal disorders in return to work programmes: A Malaysian study. Presented at *"The 9th COTEC Congress of Occupational Therapy, 24-27 May 2012 in Stockholm, Sweden."*

Chapter six summary

This study indicates that injured workers' occupational functioning and negative emotional states need to be addressed especially when they are in the off-work and re-entry phases, and participating in the RTW programme. Moreover, these injured workers' occupational competence and negative emotional states were moderately linked. The study indicates that OTs and psychologists should become involved at the beginning of the RTW programme. Injured workers' interests, roles, routines and daily living skills should be focused on by service providers because their emotional and physical well-being are vital to their ability to function. In addition, an occupational-based intervention is needed to support return to work programme conducted by SOCSO for their insured worker.

Chapter 7 Personal experiences and expectations of support in the process of return to work from workers with work-related injuries

Introduction to chapter

Murad M.S., Farnworth L. (submitted). Personal experiences and expectations of support in the process of return to work from workers with work-related injuries: An exploratory study. ***Work: A Journal of Prevention, Assessment & Rehabilitation (submitted)***

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Date of acceptance:

Date of publication in hard copy:

This study aimed to describe the injured workers' experiences of the support they have received and further expectations needed from the stakeholders. Twenty-one injured workers with different location of injuries, physical abilities and capacities were interviewed from January to March 2011. Interviews focussed on participants' experience of support of those involved with the injured workers during the process of their return to work programme. The study used semi-structured, in-depth interviews and lasted between 45 to 90 minutes. Ethical consent was obtained prior to the interview. Participants were either recruited directly by the case manager suggested by SOCSO or randomly chosen from the SOCSO database consisting of all the people referred to the RTW programme. The purpose of this study was explained by the first author via telephone to selected participants. If people were willing to

participate in a qualitative interview, an appointment was made for this to occur either at his or her workplace (guest room, lounge, or cafeteria), at home, or SOCSO's nearest office.

Monash University

Declaration for Thesis Chapter 7

Declaration by candidate
In the case of Chapter 7, the nature and extent of my contribution to the work was the following:

Nature of contribution	Extent of contribution (%)
Conceptualisation and design of the research, application of ethics, data collection, data analysis and interpretation of the results, wrote paper	80

The following co-authors contributed to the work. Co-authors who are students at Monash University must also indicate the extent of their contribution in percentage terms:

Name	Nature of contribution	Extent of contribution (%) for student co-authors only
Louise Farnworth	Application of ethics, reading, critique and providing feedback on drafts	
Lisa O'Brien	Reading, critique and providing feedback on drafts.	

Candidate's Signature [redacted] **Date** 3/5/2012

Declaration by co-authors [redacted]

The undersigned hereby certify that:

(1) the above declaration correctly reflects the nature and extent of the candidate's contribution to this work, and the nature of the contribution of each of the co-authors.
(2) they meet the criteria for authorship in that they have participated in the conception, execution, or interpretation, of at least that part of the publication in their field of expertise;
(3) they take public responsibility for their part of the publication, except for the responsible author who accepts overall responsibility for the publication;
(4) there are no other authors of the publication according to these criteria;
(5) potential conflicts of interest have been disclosed to (a) granting bodies, (b) the editor or publisher of journals or other publications, and (c) the head of the responsible academic unit; and
(6) the original data are stored at the following location(s) and will be held for at least five years from the date indicated below:

Location(s) **Department of Occupational Therapy , School of Primary Health Care, Faculty of Medicine, Nursing and Health Sciences, Monash University (Peninsula Campus), Frankston, Victoria**

[Please note that the location(s) must be institutional in nature, and should be indicated here as a department, centre or institute, with specific campus identification where relevant.]

Signature 1 [redacted] **Date** 3/5/2012

Signature 2 [redacted] 8/5/12

Personal experiences and expectations of support for return to work workers with work-related injuries: An exploratory study

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Abstract

BACKGROUND: Injured workers in the process of returning to work will face many occupational challenges as well as potentially having financial and social issues. How they are supported through these challenges is not often explored. OBJECTIVE: This study investigated the experiences of support received, and expectations of, a cohort of injured workers in the process of returning to work in Malaysia. METHODS: The purposive sample of participants consisted of 21 workers who had work-related injuries selected from Malaysia's Social Security database. This qualitative study used semi-structured interviews for 45 to 60 minutes regarding the type of support received by injured workers. Participants had sustained various types of injuries and were in different phases of return to work (RTW). RESULTS: While participants experienced several positive supports in their RTW, they also suggested that the compensation provider, case managers, employers and health professionals

provide further resources and services. These ranged from more flexibility in RTW programs, provision of clear information and communication about requirements for injured workers to the employer and more moral and psychological support. CONCLUSIONS: Stakeholders' support is important for injured workers to return to work. Some challenges related to receiving support could be better addressed if RTW guidelines were produced.

Keywords: Return to work, RTW, support, work-related injuries

1. Introduction

The World Health Organization [1] has concluded that work-related injuries, both acute and chronic [1-4] are caused by multiple factors, and managing their impact depends on the nature of the injuries. The impact of work-related injuries is shouldered not only by workers, but also health insurance (compensation provider) companies, employers and workers' families [4, 5]. In many countries, the compensation provider provides not only medical and compensation benefits to the worker, but also they take responsibility for comprehensive case management to coordinate the injured workers' return to work (RTW) [1, 2, 4]. However, every year there are increased demands due to the higher number of new people with injuries, and more public awareness from the compensation provider's in disseminating information on the types of benefits provided [4].

Employers experience the impact of lost productivity through having injured employees off-work as well as potential skill loss in the workplace [5]. For the worker, family harmony and work-life routines are likely to be affected, especially when they are off-work for a long time [6, 7]. According to Jansson and Bjorklund [6], in a qualitative study using focus groups with long term unemployed Swedish workers on sick leave, a worker who experienced temporary or permanent disability will benefit if he or she is able to speed up their work resettlement or vocational rehabilitation process. Workers who were on sick leave for more than seven months developed a negative self-image, changed life-style and restrictions on their roles and activities [6]. A recent cross-sectional study with people with work related injuries in Malaysia found that injured workers on sick leave who were in a return to work program, and in the process of re-entry, had significant problems in their health status and occupational competency, and these were associated with moderate levels of negative emotional states [8].

Understanding the issues for both employers and workers in the return to work process is complex as it includes themes of individual needs, structural contexts (e.g. supports) and the work environment, for example how equipment or work tasks can be modified [6, 9, 10]. Returning to work is often a long process depending not only on the commitment, psychological health and motivation of the injured worker, but also on the type of, and availability of support offered by the compensation provider, employer, peers, family members and the community, and the availability and skills of healthcare professionals, involved in returning the worker to work [6, 9, 10].

Because of the complexities involved with RTW, Krause and colleagues [11] suggest that future research should be based on a conceptual framework concerning disability phases. One such conceptual framework is provided by Young and her colleagues [12] who have defined RTW phases based on workers who were injured in terms of their abilities and capacities (off-work, re-entry, maintenance and advancement) (see Figure 1 and Appendix 1 for RTW phase definitions). Because the transition process of injured workers back to work can occur in a non-sequential way [12], it is important to understand how support needs may change across these phases. Sometimes the injured worker will return to work at the first RTW stage and move forward step-by-step, or he/she may start at the more advanced phases. Progression to being fully back to work could be related to many issues, such as recurrent injuries, unforeseen disabilities or environment related-factors, and available supports [12, 13]. What is certain is that it is important to understand injured workers' experiences and expectations so that all stakeholders can plan strategies that lead to best available return to work management practices. Therefore, it is important to understand what supports are available to injured workers and their experiences of those supports.

Studies concerning support for injured workers generally focus on those currently on long-term sick leave, disability pensioner schemes, exploring new jobs and those in the

process of returning to work [14-17]. They have also analyzed support received from professionals, compensation providers, co-workers (peers) and work-place support or a combination of these experiences [14-21]. For example, studies have found that a range of benefits from health professionals such as physicians, case managers/social insurance officers, therapists and ergonomists in providing interventions and support to injured workers [14-21].

Work training by health professionals can be a major rehabilitation benefit received by injured workers [14] but, some of these professionals caused delays in waiting for treatment that contributed to return to work problems, with some recipients reporting they had to wait 7 to 12 months to receive treatments [14]. Svensson, Mussener and Alexanderson [15] and Lysaght and Larmour-Trode [18] found that guidance, validation of the severity of the injuries, information on managing pain, and suggestions for work environmental adaptations and alternative work tasks from health professionals facilitated recipients return to work [15, 18]. In addition, having a supportive treatment style and professionals' socio-emotional skills (irrespective of the professionals' area of expertise) can be helpful in the recovery process [15, 18].

Two studies about peer support from Canadian provinces (Toronto and Ontario) were found, one on injured workers, the other on supervisors and injured workers [18, 19]. Injured workers peer support groups were demonstrated to be effective in RTW programs [19]. They found that they can offer social support, personal encouragement, skills in how to deal with compensation claims, RTW negotiations and knowledge of how the system works [18, 19]. The second study found that support from the employer and worker's supervisor can take the form of personal/emotional support or an encouraging approach that includes providing information on safety precautions and claims, supplying ergonomic equipment, and managing workload and modified equipment [17, 18, 20, 21]. The other support group identified was

family and friends who could help with household responsibilities, home treatments (for example, ice or heat packs) and driving employees to work and appointments [18].

In relationship to organizational support, a cross-sectional survey study from the US with workers in different companies with a history of work-related injuries found that organizational factors, such as policies and standard procedures related to disabilities management, were important in the return to work process. The policies and standard procedures facilitated communication and accommodations, such as modified equipment and work tasks [17, 18]. However, all of the above studies [14-21] have limitations in understanding the post-injury support experiences of workers while they were in the process of RTW. The nature and circumstances of injury should be assessed to identify any differential effects on perceived organizational support, return-to-work experiences, and job satisfaction after returning to work [17, 18]. Additionally, none of the studies cited have examined any potential differences in support needs between injured workers across different RTW phases covering with a range of disabilities, and physical and functional limitations. The aim of the current study was to understand the experiences of support received and expectations of a cohort of injured workers in the process of returning to work in Malaysia.

1.1 Malaysian context

In Malaysia, industrial accidents have been defined as those that happen while performing official duties at the work place that arises out of the employment, including commuting accidents [22]. Commuting accidents are defined as accidents that happen while travelling; on a route between the place of residence and the work place, between the work place and the place where the employee takes meals during any authorized recess, and on a journey directly connected to work [22]. Interest in how best to manage people with work-

related injuries, such as industrial and commuting accidents, is increasingly important for Malaysia because it is growing industrially [23].

In Malaysia, the total number of industrial and commuting accidents (55,186) increased by 1.94% in 2009 compared to 2008 (54,133) [4]. Industrial accidents, for example falls, being struck by falling objects, injury through over-exertion or strenuous movements, fell by 2.04% while commuting accidents, for example fractures, dislocations, concussions and other internal injuries increased by 9.2% [4, 24]. The manufacturing sector contributed the highest total number of accidents (17,206), an increase of 31.18% between 2008/2009. It is possible that management or awareness of health and safety in the workplace is improving, and therefore this increase can be accounted for by increased reporting of commuting accidents. Malaysia's main compensation provider – the social security unit known as Social Security Organization (SOCSO) - spent RM 1354.13 million ($US 443.98 million) in 2009 compared to RM 1186.09 million ($US388.88 million) in 2008 on benefits. This represents an increase of 14.17% [4]. More recently in 2010, this amount rose to RM 1,549.00 million ($US 507.87 million), an increase of 19.7% [25]. These figures indicate that the cost of injured workers to the government is increasing rapidly and because of the financial escalation, this needs to be addressed.

In Malaysia these costs provide invalid pensions and assistance, dependents' benefits, survivors' pensions, physical and vocational rehabilitation, nursing care, funeral benefits and general expenses for injured workers with temporary or permanent disability [4]. A critical benefit for insured employees injured at work is either the temporary disablement benefit or permanent disablement benefit. The temporary disablement benefit is for medical leave (workdays lost) due to work-related injuries. In 2009, RM 104.01 million ($US 34.10 million) was paid to 47,726 persons while in 2008, RM 94.06 million ($US 30.84 million) was paid, representing an increase of 10.58 %. In effect, 2,112,898 work days were lost [4].

Referring to the permanent disablement benefit, in 2009 RM 274.84 million ($US 90.11 million) was paid either in the form of a lump sum or periodical payments to 26,660 people, compared to RM 214.62 million ($US 70.37 million) paid in 2008. This constituted an increase of 28.06 % in claims expenditure [4].

Despite all the benefits given to injured workers and their families, prior to 2008 SOCSO provided little support or programs to enable insured workers to return to work. In 2008 SOCSO adopted the disability management model that had been practiced by Western economies such as Australia, Canada and Sweden, to manage injured workers via the bio-psychosocial model of RTW. This RTW rehabilitation program introduced by SOCSO for insured workers in accordance with the Employees' Social Security Act 1969 Section 57(1) is coordinated by case managers. To be entitled to benefits from SOCSO's protection scheme, Malaysian citizens and permanent residents must be registered, contributing financially monthly to SOCSO, receiving permanent and temporary disablement benefits, and need to be recommended for rehabilitation by the Medical Board, Special Medical Board or Appellate Medical Board [26]. Injury or disability needs to happen in the course of their employment, including at their workplace, commuting to and from the workplace, and also includes occupational diseases such as pulmonary tuberculosis and bacterial diseases (e.g. plague) [24]. This program's implementation has been applauded by workers and employers alike [27]. The program is perceived as the government's social obligation to help injured workers to be actively contributing to their country. At the end of December 2010, 2,518 injured workers had returned to work [27].

In the Asian context, a previous study from Hong Kong demonstrated that a case manager, who also acts as coordinator in the RTW program, is very effective in promoting workers' return to work, and improving workers' abilities, and their service is a cost benefit [28]. However, there is little information about workers' experience of what supports they

perceive are beneficial, or how this facilitates RTW. Additionally, there is no information concerning how the support is similar or different across the RTW phases. An advantage of understanding the Malaysian RTW experience is that workers are both diverse in ethnicity and religiosity, including respectively Malay, Chinese and Indian, and Moslem, Buddhist, Tamil and Christian. Therefore findings may have relevance in other multicultural, predominantly Asian environments.

This study aimed to understand: firstly, what sorts of supports employees injured at work experience, and secondly, how these assist the worker in the return to work process and the experiences of support offered by relevant contributors.

2. Method

The research was a cross-sectional study using a qualitative, interpretative approach [29, 30] to document the experiences and expectations of injured workers [31, 32]. Such an approach provides vital information for case managers, therapists and stakeholders to provide the most appropriate services. The study used semi-structured interviews with individuals who were currently at different phases in RTW (off-work, re-entry, maintenance and advancement), to identify similarities and differences within the total group. Interviews lasted between 45 to 90 minutes. Ethical approval was obtained from the relevant University of Human Research Ethics Committee and SOCSO prior to the study being conducted.

2.1 The sample

Participants for this study came from SOCSO who were registered with the RTW program and had different case managers. In this purposive sampling approach [29, 30], 10 out of 30 participants were either recruited from direct approach by the case manager suggested by SOCSO or randomly chosen from the SOCSO database consisting of all the

people referred to the RTW program. Twenty out of 30 participants were chosen from the SOCSO's database. This was to ensure that other categories that were not referred by the case managers were included as the SOCSO database covered people with a wide spectrum of disabilities, causes of injuries, and at different RTW phases. To limit the variation of the group, the sampling included only workers who had work-related injuries (either commuting accidents or industrial accidents) at different RTW program phases described by Young and colleagues [12] (see Appendix 1). There were seven participants at each phase (off-work, maintenance and advancement) except phase re-entry who have nine participants. All participants were drawn from two mixed socio-economic populations in the states of Klang Valley and Malacca. These two states are known as high industrial and tourism economies with mixed populations of Malays, Chinese and Indians.

The case managers asked all potential participants if they would be interested in being in the study; if they were, the case manager referred them to the first author. The first author made the initial contact via telephone and the purpose of the study was explained to interested participants. The participants had been briefed on the right to participate or not without any implications for their current treatment being received. Their identification would be kept confidential from SOCSO. If people were then willing to be interviewed, an appointment was made for this to occur either at his or her workplace, at home, or SOCSO's nearest office. Out of 30 participants who were contacted, 21 agreed to participate. The mean age of the participants was 37.76 (range= 22-54) years (see Table 1).

Table 1. Participation details

Participant	**Sex**	**Age**	**RTW phase**	**Body part injured**	**Ethnicity**	**Marital status**	**Accident type**
1	M	28	maintenance	trunk	Malay	married	commuting
2	M	37	re-entry	lower limb	Malay	married	commuting
3	M	53	maintenance	upper limb	Chinese	married	industrial
4	M	29	off work	lower limb	Indian	single	commuting
5	M	32	advancement	lower limb	Malay	single	commuting
6	M	23	off work	trunk	Malay	single	commuting
7	M	39	maintenance	trunk	Malay	married	industrial
8	M	46	re-entry	trunk	Malay	married	industrial
9	F	38	maintenance	upper limb	Malay	single	commuting
10	F	54	maintenance	trunk	Indian	single parent	industrial
11	F	29	re-entry	lower limb	Malay	married	commuting
12	F	46	maintenance	upper limb	Indian	married	industrial
13	F	46	off work	trunk	Malay	married	industrial
14	M	26	re-entry	lower limb	Malay	married	commuting
15	M	38	off work	neck	Indian	married	commuting
16	M	36	re-entry	lower limb	Indian	single	commuting
17	M	48	off work	upper limb & lower limb	Indian	married	commuting
18	M	29	advancement	lower limb	Malay	single	commuting
19	M	22	re-entry	head	Indian	single	industrial
20	M	38	off work	head	Malay	married	industrial
21	M	39	re-entry	trunk	Malay	married	industrial

Note: M=Male, F=Female

2.2 The Interviews

Eighteen interviews were conducted and audio taped by the first author on a one-to-one basis, and three participants were accompanied by a spouse, parent or sister. Sixteen of the participants communicated in Malaysian language and the remaining three used English language. The first author, who is fluent with Malaysian and English languages, transcribed the audiotapes and translated relevant transcripts into English. The interviews guided by a semi-structured schedule, concerned the return to work process and the types of supports received. The interviews were informal and encouraged participants to voice their experiences and expectations regarding support during the return to work process.

2.3 Data Analysis

All transcripts were transferred to NVivo9 software (QSR International, 2010) to assist with the data analysis process. Thematic analysis [33] of semi-structured interviews was guided by a comparative method [31, 32]. Reading and re-reading the interview transcripts was used to give an overall picture of the content, followed by line-by line coding of the first four interviews by the first author and then independently by the second author to reach agreement. The codes were then organized into categories and these categories were compared and contrasted allowing sub-categories to emerge. Sub-categories were identified and interpreted in the context of injuries and current disabilities.

3. Results

Participants identified several groups of supports. These included compensation providers, employers, co-workers, healthcare providers, families, communities and NGOs. The following describes their experiences and expectations toward them.

3.1 Compensation provider

Insured workers spoke both positively and negatively about their experiences with the compensation provider, SOCSO. Of the 12 participants who spoke positively about permanent and temporary disablement compensation benefits, they reported that SOCSO not only paid a lump sum for injuries sustained, but also paid for hospital bills for surgery, aids, medications, and other expenses. For example Saras who had a prolapsed disc back injury, due to an industrial accident said:

> SOCSO still helps me pay the [road] toll bill and the gas [to commute to the hospital]. I get the letter [evidence of attendance from physiotherapist], every time I go to Puchong [name of town] and submit all of it. I get more than what I want. *(P10, maintenance phase)*

Half of the basic salaries of insured workers were covered by SOCSO when the person was on medical leave. Hafiz who had a left fibula fracture due to a commuting accident stated:

> Well, SOCSO provided for me so it's good. Praise to Allah, I got help from others and medical treatment. So, SOCSO is quite courteous. Thank God I can return to work and my leg is getting better. I just carry on with the RTW program. What they give me, I just follow it. The medical treatments I have received were the best. Maybe I would have to pay if I'm not in the program. It's just I have problems to follow up [unable to attend the appointment given]. *(P5, re-entry phase)*

So for Saras and Hafiz and others, the financial aspect of the scheme was invaluable. It is interesting that almost all Moslem participants who were satisfied with the compensation given by the SOCSO, like Hafiz, attributed this to Allah or Fate, that they will be provided or

helped with problems [34]. However, the following indicates other aspects of the SOCSO program that were more problematic.

A common concern was that participants expected program flexibility. For example physiotherapy sessions were at fixed times and often did not fit with their work schedules but workers were expected to carry on with normal workplace tasks. For example, Hafiz said:

> Ah… well for me as a shift worker, it would be good if the time [for the session] is flexible. If they can extend it [changed the treatment session], then I have no problem. But then I have to be motivated [needs encouragement] to go for treatment. *(P5, re-entry phase)*

The SOCSO RTW program has guiding timelines, for example, three months to achieve maximum medical intervention for certain treatments, and for some participants, this was not enough time to recover from severe injuries. Injury such as spinal injuries (i.e. prolapsed intervetebral discs) need more time for recovery [35].

Four participants talked about negative experiences concerning the SOCSO monthly compensation benefit that covered their basic salary while they were on sick leave. They argued that normally by doing overtime, they earned more than their basic salary, and they relied on this for payments such as home, car and personal loans. Additionally, this financial stress impacted on family life. For Alegendran, who had trunk injuries, prolapsed disc C3, 4 and 5 as a consequence of a commuting accident said:

> "Well… it is costly. I have a lot of debts. Frankly, RM 500 [$US 163.90] per month is not enough [temporary accident benefits paid by SOCSO during sick leave]. I have a lot of debts, it's made me anxious. If I can get RM 1000 [$US 327.87] it would be enough. My basic salary is now RM 800 [$US 262.29]. SOCSO gives me only RM500 [$US 163.9]. After all

> with my over time I can earn RM 2000 [$US 655.74]. I would like to get more because if I get RM 500 [$US 163.90] I have to pay my mortgage, which is RM 700 [$US 229.51] a month. Now, I only pay the interest. I bought the house in 2004. Ever since I began work here, it was OK but now I'm injured. After I was injured, I became unhappy. When I see my wife, she also has lost all her motivation [to carry on with their life]. *(P15, off-work phase*)

In Malaysia, the average household (family) size in year 2010 was 4.31 compared to Australia in year 2006 it was 2.6 [36, 37]. Participants with many children were similarly, if not more, affected. Furthermore, some of them stated that a compensation provider should also cover other costs that are not visible (e.g. petrol, food, lodgings), especially when people lived far away from hospital. For Muniandy who fractured his left humerus plus a below knee amputation, who had four children said:

> My salary before my injury was RM 725 [$US 237.70], but SOCSO gives RM 300 [$US 98.36] monthly. It's not enough, Sir. Before [my injuries], I usually worked and did overtime and I could earn RM 1000 [$US 327.87] a month. I have to pay my mortgage, RM 200 [$US 65.57] every month. I bought the house before I was injured. Now, I have to pay the mortgage, my children's school fees, expenses, etc. (*P17, off-work phase)*

Two participants who had reached retirement age worried that they would be unable to continue working with their current employer or elsewhere due to their disabilities. In Malaysia, workers in the private sector under the Employment Act (1995) and Employees Provident Fund Act (1999), have a retirement age of 55, and it is up to the employee to continue working or the employer to renew the workers' appointment [38]. Some workers

stated that the lump sum compensation they received did not fit their expectations and they felt it would be difficult to survive when they were retired. For example, Saras who was 53 said:

> Actually, I'm not only worried about now, I'm worried as my age increases. I can work for another two years. If I am like this, how am I going to work? Who's going to support me? If I'm healthy I can get work as a security guard [In Malaysia, females normally work as security guards in low risk security areas, for example hospital and school] … I cannot do my work …. I cannot stand. I have RM 30,000 (US$ 9,836.87) in my EPF (Employee Provision Fund)... Because my husband passed away, I take the money and pay for the house because my house [mortgage] is not paid off. Hutang [debt] is a lot. So, I pay the hutang with the EPF money. If SOCSO is willing to give me a monthly payment that is also good. At least I can get support. *(P10, maintenance phase*)

Some participants suggested that employers and employees required more information and awareness regarding SOCSO services. Currently SOCSO disseminates information through their website and electronic media, such as television and radio. Participants said that some workers who were injured did not receive benefits due to their lack of knowledge, or not understanding the process for claiming compensation and benefits. Even some staff in the administrative department did not know the procedure to claim from SOCSO. For example, Singh who had dislocated his left knee in a commuting accident stated:

> At the moment, I'm happy to know that every Thursday they [SOCSCO officers] have a meeting between SOCSO members and the public [open day for SOCSO to public, at community gathering e.g. mall]. And most probably,

> they can disseminate their services to the public via different media. All Malaysians don't know [about the program], because not everybody has the Internet. There are thousands, millions who don't go to the website. There are many people with injuries who don't go to SOCSO because they don't know about the return to work program. *(P16, re-entry phase)*

3.2 Case managers

The case manager plays an important role in the RTW program. SOCSO believes that by using a case management approach where a case manager is appointed for every person (case) in the program, the RTW can be managed professionally and systematically [39]. The Australian Commonwealth Rehabilitation Services (CRS) was consulted before starting the program, and three of the SOCSO case managers were sent to CRS for training in the RTW program. All of them were educated in the area and many of the case managers were qualified in health sciences such as occupational therapy and physiotherapy [39]. Every case manager is responsible for the referred case from the first day until the end of the process. four to five cases per day targeted for each case manager. Case managers do the initial assessment, where they identify problems faced by the insured worker, and then plan what rehabilitation assistance that he or she needs. The insured worker may need counseling, psychological assistance, work assessment etc. The case managers are responsible for exploring issues in-depth with the injured workers, and to educate them to enable them to have the best form of social security through employment.

Most participants reported a positive experience regarding the RTW program in that they were happy with the case manager facilitating coordination with physicians and healthcare providers. Case managers were also applauded with assisting in the compensation process

such as claiming benefits. Zaidi (32 years), who had back injuries due to a fall at his workplace commented that:

> She [case manager] helps me a lot. She handles my claim. My claim is delayed because of my employer. She asked me whether I want to go back at work. I said yes but not in that company [former workplace]. Yes, I am satisfied [with case manager services]. They even want to send me to training centre if I didn't get this job. They want to train me and find me the appropriate employer with my skills. It's really helpful. *(P23, re-entry phase*)

Conversely, some participants felt that case managers were unable to fulfil their commitments or appointments. Injured workers were also not clear regarding the terms and contract with RTW. There was not much communication or negotiation with the employer, and they believed that there was more room to improve this situation. The following indicates other negative experiences that need to be highlighted such as, meeting with employers and the need for clear information and communication.

Participants suggested that it was important for the case manager to discuss the injured worker's condition with the employer, and at the same time recommend a suitable job or light/other duties. Modifications of equipment, job tasks and facilities for the injured worker were important elements of RTW. If there was an issue or conflict between the injured worker and employer, it was the responsibility of the case manager to negotiate or take appropriate action. Iwan (23 years) was now in a wheelchair due to having a spinal cord injury as the result of a commuting accident. He had previously worked on a toll gate and wanted to return to work because his medical leave had expired so he had no funding. However, he anticipated that he will be facing problems due to his disability. He commented that:

> She [the case manager] is supposed to go to my office before I start[ed back at work after my injury]…. She is supposed to come before and after I start work. She has to know the things have to done as I asked for, so that when [I return to] work it's already there. She came on 9/2; I started to work on 9/1. I have to get through it. There are a lot of problems that I have to bear. *(P6, off-work phase)*

According to several participants, the case manager needed to discuss the RTW program clearly so that the injured worker was aware of the coordinator or facilitator's role in this program. Some injured workers had high expectations that went beyond the scope and objectivity of RTW. For example Zamri who injured his knee working as a dispatch boy stated:

> About this program, I don't have a clear idea about it. [The case manager] has explained to me about how they want to [wait until my leg has healed] and all, but how do they do it? Is it [the treatment and cost of payment] when I have fully recovered or is there a limit [only certain number of session's treatment]? *(P14, re-entry phase)*

Three employees felt that the case manager needed to follow-up how an injured worker was progressing but this did not happen. Participants expected that the case manager would fully understand their health condition and would be able to convince the employer about their situation, or find a better solution to their problems. Tan, who had third degree burns with limited range of motion with his digital phalanxes, previously work as a senior electrical technician. He raised the importance of following up his progress:

> This [RTW] program is good. But [case manager] need more attention. You need regular monitoring of the progress of the patient, [you] need a report

> about the treatment every 3 months, 2 months, 1 month; how is your progress? Get the report from the physiotherapist. Progress to a certain level, they must have those records. *(P3, maintenance phase)*

In summary, injured workers had high expectations of case managers especially when in the process of re-entering the workplace. The believed that case managers need to meet with the employers to discuss issues arising concerning a worker's return to work, and for them to communicate clearly about the benefits and objectives of return to work.

3.3 Employer

Participants' experiences of employers differed depending on the employer. Two sub-categories emerged from this category: financial and moral/psychological support and formal agreements made between employers and employees that was facilitated by the case manager. Seven participants talked about positive support from their employer who gave light duties to injured workers modified tasks and equipment. Azyan who had a prolapsed disc commented:

> After 2-3 months [when I came back to work my employer] gave me light duty work. He has to actually because the work is too heavy [for me to do with my injury]. Now, work duties in my section are a bit lighter. *(P8, Re-entry phase)*

Some employers or supervisors also provided moral support such as visiting the injured person during hospitalization, and providing psychological support. In Malaysia, depending on the organizational policies, some employers paid for injured workers hospital admission, operations, and lent money for hospital bills and medications. In addition, some of the employers bought other personal insurance to cover their employees for example, prudential

insurance, while others paid workers' salaries (full or half of the salary) to the value of 2 to 6 months while they were on sick leave. Furthermore, some employers organized emergency plans for the injured worker and allowed time-off for further treatment when the person returned to work.

However, there were employers who were not supportive in that they only paid for medical leave for one month, or did not pay at all. Such employers did not appear to understand why the injured workers needed medical leave or pay for medical expenses, did not know how to process a claim from the compensation provider, and did not appear to be concerned about the worker's situation. Zamri who had a lower limb injury stated:

> The problem occurred when I was on medical leave only. [My boss] thinks I just take leave for fun. Maybe he had a shortage of workers, so, he keeps pushing me. I have explained to him [that I have an injury] and he didn't say anything and that is why I'm moody with him. I was in hospital for a week, and have been staying at home for two months but he never came to visit me. *(P14, re-entry phase)*

Some employers also did not follow the recommendations made by doctor/ physician/therapist for an injured worker to do light duties, such as providing facilities and modifications for injured workers with physical limitations. Consequently, their employment itself could be jeopardized. Nazri who had a head injury as a consequence of being hit by rock hammer had little communication so his spouse spoke on his behalf. She said:

> Yes, he was supposed to work light duties because the Doctor gave him the certificate, but they didn't assign him for light duty. They said there is no light duty work here. We have sent a lot of letters [application to employer to consider for light duty jobs] but that's what they said. *(P20, Off-work phase)*

Similarly Tan, who previously was in charge at a power station but had limited hand function because of third degree burns, had been assigned by his employer to be the new health and safety officer:

> I never told them my limitation; they will get the impression that I'm lazy. They don't bother to ask. They should have asked and I should have told them also. The ability to work to what extent, they never asked. *(P3, Maintenance phase)*

3.4 Family and coworkers

Family support such as spouse, parent, children, siblings and relatives was identified as very important when injured workers were in the process of RTW. Family support not only involved assisting injured workers with daily chores, such as washing, mopping and shopping, but also giving moral support, understanding the injured worker's problems and assisting with financial burdens. Kamala said:

> At home my daughter helps me [house chores], because nowadays only, I'm getting worse [because of my health condition which is deteriorating]. Now, I fell down two times already. So, [I] get pain nowadays. *(P12, re-entry phase)*

When the worker is injured, often a spouse will need to take on the financial difficulties such as making home loan payments, car or personal loan, etc. For example, Zaidi commented that:

> My wife [helped him with financial difficulties]. She understands. They [relatives] are just the same as me [they have money worries]. I don't rely so much on my family I want to do it by myself. If I ask them for money, I wouldn't be able to pay them back. *(P23, re-entry phase)*

However, family and friendship support in understanding the issues that a work related injury has on personal relationship, including friends, family and intimate partner, is also important as there are implications for longer-term support beyond the workplace and is a key factor to surviving. Family and colleagues (co-workers) also play an important role especially when the injured worker is hospitalized and is in the process of return to work. According to Shahril:

> [Family] take good care of me. I could never repay them. Colleagues are also the same. When I arrived at the hospital, they were already there waiting for me in the emergency ward. *(P2, re-entry phase)*

Some coworkers offered financial support during the off-work phase, gave encouragement and moral support during hospitalization, empathized with the injured worker's limitations and provided a helping hand in the workplace. For example Zaidi said:

> I borrowed [money] from friends, which is why I sold the car. Someone bought the car and I settled all my debts. Only God knows [how important this was]. *(P23, re-entry phase)*

3.5 Other agencies

Participants also mentioned that other agencies play an important support role with injured workers. In Malaysia, the welfare department of one government agency will give financial support to severely disabled workers who were subsequently unable to return to work but they need be registered (to fulfill criteria of disabled people). This is Malaysian government policy, and this support is additional to the SOCSO compensation scheme. Injured workers with many children whose spouse was not working are entitled to receive monthly financial

support from the Malaysian government agency (welfare department). For example Iwan's (spinal cord injury) parents spoke on his behalf saying:

> Welfare does give money - RM 300 ($US98.36) a month. If unemployed, the [welfare department] give RM 150 ($US49.18) [welfare department gives monthly allowance (incentive)]. We [parents] didn't know about it, [Iwan] just received the RM 300 ($US98.36) allowance. [Iwan] said [to welfare officer] that he is working but he is currently on leave. Maybe the person in charge didn't hear him. There is nothing else besides the allowances. *(P6, Off-work)*

3.6 Healthcare providers

Almost all of the injured workers had a positive experience with healthcare providers. As mentioned above, some injured workers received a letter from their physician recommending light duties at work. This proved to very helpful for employees to be able to inform employers when determining the limitations on their physical ability. For example, Saras said:

> [Physician and therapists] say I cannot work a lot, cannot do heavy work. The university hospital gave me the letter saying [I] had to [rest]…two weeks where I… cannot do heavy work. After that, they give me a letter saying that I cannot do heavy work in my job. So, they give me light job and now I'm in the office [happy and satisfied with the report]. *(P10, Maintenance phase)*

Thirteen injured workers commented that physical therapy interventions especially helped to improve their physical ability and ability to overcome pain. However, other issues that are not related to such problems that must also be addressed, especially for people who have limited

education, language barriers and limited choice of jobs. Kamala who had lower limb injuries and worked in food services reported:

> Last year I got pain, pain, pain. Then I got 40 days MC [sick leave]. Pain in here [pointing to leg], I cannot push the trolley. The nerve, they do the exercise here [pointing to leg]. Physio here, I got pain here [pointing to the area that affected]. Then, when I start doing [physiotherapy] here already the hot pack and got pain here [pointing to the area that has been treated]. So, I go and see the doctor who said that we cannot do anything, you have to work slowly but at my workplace they don't have light work…I never read, never study [at school]. Someone helps me [to get] work here, so I can speak a little bit only. So, I get to work, I work here. I don't know other place to work. I go to laundry where I also have to push. Housekeeping everything must [push]. So, I do this work slowly; tell the doctor I don't want the letter. Because [I can only do] light duty, I cannot work. *(P12, re-entry phase)*

That is, Kamala was a local worker and had little understanding of the language and was therefore restricted to jobs where Malaysian language was not needed. In spite of receiving physical therapy, any job that required physical abilities, such as pushing a trolley, was problematic.

There were, however, also negative experiences with the healthcare providers where people were not satisfied with physician/therapist services and appointments. This may even involve negligent services. Sarah who had fractures at left tibia bone due to a commuting accident stated:

> My specialist who in Kajang Plaza Medical Center was "lepas tangan" (irresponsible) because when I was hospitalized he [said he] was there every

> day. According to nurses, during my appointment I haven't met him. He kept cancelling the appointment. *(P11, re-entry phase)*

Some workers were concerned about losing their job. They also raised the issue of the therapist's report jeopardizing their job security if their competence was questioned. In Malaysia, laboring salaries are cheap as there are so many immigrant workers who come for work from Indonesia, Myanmar, and Bangladesh due to Malaysia's booming economy [40]. Illiterate or poorly educated people usually work in manual jobs, but because of this, if they are injured, their job security is threatened. Three participants said that despite healthcare providers providing a letter of support for their return to work, their employer hesitated to review it. For example, Tan commented:

> I got the test results [of what], how many pounds I should lift, carry, etc. But they [the employer] never bothered to read it. *(P3, maintenance phase)*

Other workers had similar experiences. Azyan stated:

> Recently, I have a friend but not in my department. He is in production. He has a problem quite similar to me but he has heart condition and also hypertension. He has to attend treatments. Management will see us as not being profitable to them. Company will pay but there's no benefit for them. So, they will ask us to quit the job. *(P8, re-entry phase)*

4. Discussion

SOCSO's RTW program with case managers was beneficial for many injured workers but participants suggested that there was room for further improvement. At the off-work phase, for example Alegendran and Muniandy, had expectations that compensation will not only be based on injured workers' disabilities, but also will consider their liabilities, such as their role

as sole breadwinner, having dependent children and spouses, and other personal commitments (car, house or personal loan). Although workers' personal liabilities are beyond the compensation provider, a sensible strategy is needed so that injured workers can manage their overall life, not just their work life, otherwise this puts at risk family harmony and socioeconomic security. This need for securing further financial benefits and understanding, and communication between the service providers in relation to the workers' compensation system was also raised by Brines and colleagues [41]. They reported that by assisting workers' personal situation (for example financial needs) may result in early RTW and overcoming barriers that may delay a timely RTW.

The majority of Moslem Malay injured workers (for example Hafiz, Shahril and Zaidi) had their expectations fulfilled compared to non-Moslem injured workers. This may have been due to fatalistic belief that Allah, or Fate, will provide, or help them to deal with the problems they were facing [34] . While this attitude could be problematic if their needs were not being fulfilled, a fatalistic belief could also lead to less worry and a more optimistic attitude toward life. For example, Lofvander [42] found that Moslem Turkish injured workers who were generally more fatalistic about their future health, were working, at least part-time, at the three and eight month follow-ups in comparison to people with other religious beliefs [42]. This issue needs further exploration as to what extent their fatalistic belief can affect injured workers ability to maintain a positive attitude in the RTW process.

At the re-entry phase, as illustrated by Hafiz, SOCSO needs to review their guideline to make the program flexible, especially for injured shift workers, or those having severe disabilities requiring long term rehabilitation, such as those with injuries to trunk and lower limb. A

previous study found that some of the injured workers felt pressure to get better faster because of unrealistic recovery guidelines made by the compensation provider [43].

Injured workers, such as Kamala and Zamri expected case managers to have more authority. Their contribution not only facilitated coordination during the treatment and rehabilitation process, but also was required in the re-entry phase of return to work. Two previous studies from US and China found that the majority of employees and supervisors were positive about RTW for injured workers that were coordinated by a case manager [44, 45]. Negotiation and consultation with an employer when the injured worker is physically incapacitated is vital because, as has been suggested in this study, workers desire workplace support. Previous studies have also suggested that case manager-employee interaction is needed to ensure successful return to work [44]. For example, Busse and colleagues found that it was important for case managers to discuss plans for accessible facilities and modified work tasks that are agreed upon with the employer [44]. This agreement is likely to ensure injured workers who have ongoing limitations are able to return to work safely and earlier.

In addition, this study also supports Huang, Shaw and Chen [16] who suggested that policy and standard procedures on how to manage injured employees is recommended [17]. In other countries such as Australia, any dispute or unwillingness of the employer to cooperate can be taken to a court of law, something that a case manager can initiate if the employer was uncooperative with the RTW process. In Malaysia, this is not possible because currently there are no effective guidelines or regulations where employers must comply with the case manager's jurisdiction or advice. In Australia, WorkSafe Victoria has guidelines for employers and employees in RTW [46, 47]. In Malaysia, this lack of clarity meant that some of the injured workers thought that they would receive treatment until fully recovered. Previously Russo and Innes suggested that the provision of workplace-based occupational

rehabilitation services, combined with case management, provides a comprehensive and attractive package to employers [48].

This study also reinforced that employers must not take their responsibilities in taking care of injured workers for granted. In off-work, re-entry and maintenance phase, for example Tan, Nazri and Zamri experienced negative support from their employers. Although SOCSO has made a major contribution to injured workers' welfare, the system needs further development in terms of supporting injured workers through financial issues and offering moral/psychological support. This constitutes an important cultural issue for Malaysian workers, because the employer must be seen to take care of not only injured employees' financial matters, but also visiting them, and in this way offering moral support to demonstrate that employers value their workers. Also, their support is important in understanding physical limitations and providing modifications to equipment or work tasks. For example, Young [13] found in a RTW maintenance group that as long as the duties were within the injured workers capacity, and there was support from co-workers and employers, workers kept working, even though they may have been experiencing symptoms such as pain [13]. A systematic review by Carroll and colleagues [49] demonstrated that employer participation and work modifications are more effective than other interventions (e.g. exercise at workplace), and cost effective for returning injured workers back to work. Similarly, Tullar and colleagues [50] reported that organizations that committed to return to work programs (i.e. purchase of appropriate lift or transfer equipment and ergonomics training program) provided positive perceived health benefits to their all employees and clients.

The study also has identified that the healthcare provider's role must be extended to the place of work, especially when injured workers are in the re-entry phase. Health providers (i.e. occupational therapists and ergonomists) have been found to play an important role in return

to work process [51, 52] and that the importance of knowledge exchange between health professionals, injured workers and supervisors leads to a more successful program outcome [53]. Their professional reports are critical and this needs to be recognized by the employer or management. In this study, employers response to reports by health professionals is also supported by a Canadian study where injured workers reported that their employers were reluctant to accommodate health professional recommendations upon return to the workplace [43]. Perhaps their role and reports should be stipulated or recognized together in the RTW guideline. Without the health professional's report and recommendation being included in guidelines, injured workers may feel insecure or that their injury is not taken seriously.

Of particular significance for Malaysia, is the potential threat to local injured workers from workers from Indonesia, Myanmar, and Bangladesh coming to work in Malaysia. This is in part due to Malaysia having a booming economy in industrial and tourism sectors [40] but currently there are potentially 2 million foreign workers [40] who are often illiterate or have poor education, so they usually work in laboring and factory sectors. For local workers with poor education, this is a concern because they also have to compete with the foreign workers, and negative reports from health providers can result in dismissal. Proactive support in the form of education and consultation by health professionals for the employer is a good strategy for future scenarios should such accidents occurs for any worker. Education and consultation must be included in developing effective guidelines when dealing with uncooperative (hardliner) employers. Issues of delaying treatment and appointment need to be resolved as was found in by Landstad and colleagues [14].

In this study, family, relatives and peers (colleagues) constituted important sources of support when workers face the transition process of RTW, especially in the off-work and re-entry phase. They not only assist them with financial help, but also provide moral support during this difficult stage. Extra attention is needed in the form of motivating injured workers so that

they can plan for the future. Similarly, assisting the injured workers commuting to work place and hospital was also found by Lysaght and Larmour-Trode [18]. Perhaps another approach that can be implemented by the case manager is to form 'peer group' support groups for injured workers to be able to share the difficulties and issues related to compensation [18, 19].

In the maintenance and advancement phase, for example Saras and Tan, injured workers who were reaching the age of retirement were worried about their future life, especially when they were a single parent or had many children. Currently, retirement age for Malaysian workers in the private sector is 55 years. This may need to be revised as lifespan of Malaysian people has increased from 60 in 1960's and 1970's to 75 years [54]. The Worker Labor Union is currently working with the Malaysian government to increase the retirement age with workers working in private and government sectors [55]. Other agencies, such as welfare and religious departments, are equally important in the filling the gaps that SOCSO cannot do as a compensation provider. These include, for example, accessibility, public transport and community participation.

Conclusion

This study aimed to understand the experiences and expectations of support received by injured workers who had various disabilities, but also from the standpoint of addressing different involvement in the context of the current existence of Malaysian's culture and system. In Malaysia, support for workers who are injured must not only be borne by SOCSO and workers' families and their employer, but also other government organizations such as welfare and religious departments. Case managers and healthcare providers currently play the most important roles in the whole RTW process, especially when workers are injured and

trying to return to their workplace. Changes are recommended for legal requirements on employers' participation and guideline of RTW for case managers and healthcare providers. The legal system may have to be enforced so that this system runs more smoothly.

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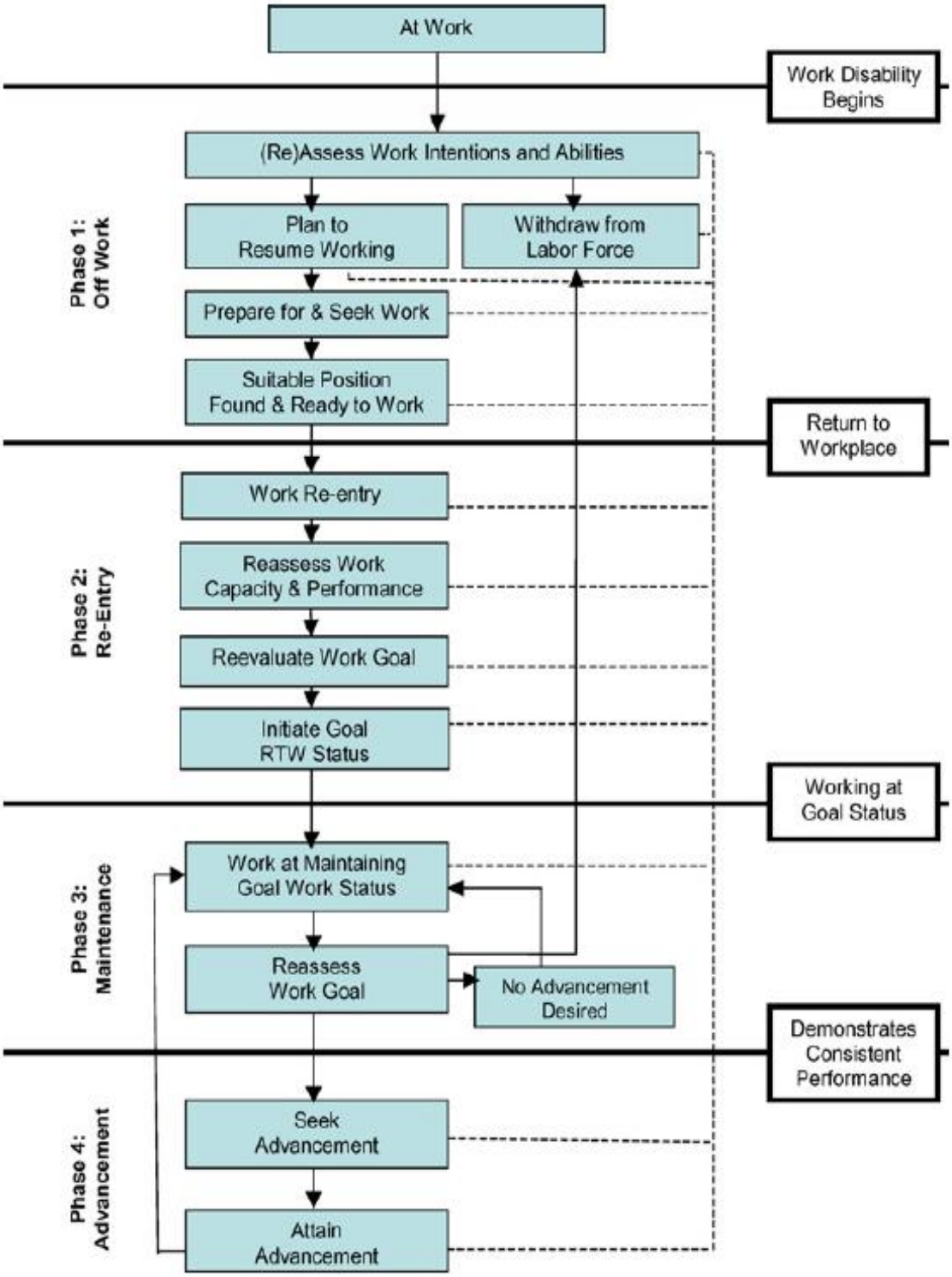

Figure 1: The four phases of RTW (Young et al., 2005)

Appendix 1. Young et al.'s definition of RTW phases

Phase *Off-work*:

Workers are off work due to their work-related injuries. At no time during this phase are they back at work, either in pre-injury or in an alternative capacity, and are still receiving medication and rehabilitation. During this phase, they are being assessed for functional abilities, employment-seeking behaviors and motivation to return to work.

Phase *Re-entry*:

Workers are just recommencing their work. They have been given a modified task, time off, or a job which has different requirements to reduce or better manage their pain. While they are working, they may experience recurrent symptoms or disabilities (for example pain, restricted activity, physical and mental functioning limitations) which may have caused them to take time off from normal working hours.

Phase *Maintenance*:

The workers are continuing to work at their previous capacity and ability. They are able to perform their duties or tasks satisfactorily. They are able to achieve productivity levels or goals over the long-term, and demonstrate potential for advancement.

Phase *Advancement*:

The workers are able to improve their work responsibilities and increase remuneration levels. They are able to further their personal career development. They may have been chosen to undertake educational programs and are pursuing short- and long-term career goals.

Appendix 2. Topic list used as a guide for interviews

- Explain to me what type of compensation you have been given by SOCSO. (Prompt: Is it enough to cover your injuries? Is it what you expected? What other type of compensation do you recommend?)
- Tell me about your RTW goals. (Prompts – What were they, who developed them, what involvement did you have, have your goals been achieved? How? Were they what you expected, felt that it addressed your specific issues?)
- Can you tell me more about the RTW services in which you have been involved? (What were they? In what ways do they help/not help you? Is this what you had expected? How?)
- Can you explain how you managed the tasks given to you when you returned to work? (Prompts: What were they, who helped you, what strategies were used, what supports did you have from your employer? Who was supporting you, did the supports benefit/not benefit you? Are there any recommendations that you think can improve your situation?)
- Tell me about your current performance after the injuries. (Prompts: What are the tasks that are difficult for you to maintain? What supports do you have? Who is helping you? Do you feel confident that recurrent injuries will not happen again when you return to your previous work? Why?)
- What sorts of supports have been available from your employer/organization? Were there other supports that you would have liked – can you explain further? If someone you knew had an injury like yours, what would you recommend that they do to make sure that they received the right sort of support from the employer/organization?

- Describe any supports from other people that you had during your injury phase. (Prompts: Who was affected by your injury, e.g. family members? What things were affected, e.g. helping out at home? How did you manage?
- Tell me during your injuries what agencies/parties gave you support. (Prompt: Who are they? What type of support was given? What other supports do you think you needed?

Impact of the study

Murad M.S., Farnworth L., O'Brien L. (submitted). Personal experiences and expectations of support in the process of return to work from workers with work-related injuries: An explanatory study. ***Work: A Journal of Prevention, Assessment & Rehabilitation (submitted)***

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    - Public Health, Environmental and Occupational Health : Q3 (217th of 335)
- H Index: 21

Given that this study is yet to be published in a peer-reviewed journal, it is difficult to ascertain its impact. The actual findings of the study showed that there were positive and negative experienced support obtained from the stakeholders. There are many expectations needed from the stakeholders and a guideline of RTW must be developed to generate full and genuine participation and cooperation amongst the stakeholders. A report has been developed to the board of SOCSO and DOSH, Malaysia regarding the findings, and suggestion to attain the injured workers expectations. This study has been presented internationally at occupational therapists conference. Findings will also be presented at other local conferences subject to abstracts being accepted.

Murad M.S., Farnworth L., O'Brien L. Personal experiences and expectations of support in the process of return to work from injured worker with work- related injuries: An explanatory

study. Presented at *"The 9th COTEC Congress of Occupational Therapy, 24-27 May 2012 in Stockholm, Sweden"*

Chapter seven summary

In the previous chapter, important themes were obtained from various stakeholders. *Compensation provider (SOCSO):* flexibility was needed in RTW programmes, as well as the need to review the amount of compensation, education and awareness on claiming compensation. *Case manager*: participants would like to see that case managers were able to meet with employers so that there was an increased likelihood of clear information and communication. *Employer*: financial and moral/psychological support from the employer and objective agreement between employers and employees. *Healthcare provider*: Participants wanted extended services at the workplace, appointment schedules. They also commented that they felt insecure with therapists/physician report because of the impact that could have on their future employment. Workers who were their family's sole breadwinner, and who had low educational qualifications and were employed in small and medium company represented those most affected by the RTW process. Stakeholders' support for injured workers is important. RTW guidelines must be embedded in government regulations on workplace occupational health and safety issues to generate full and genuine participation and cooperation.

Poster presented at the 9th COTEC Congress of Occupational Therapy, 24-27 May 2012 in Stockholm, Sweden

Medicine, Nursing and Health Sciences

Personal experiences and expectations of support in the process of return to work after injury: An explanatory study

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Introduction

The impact of work-related injuries is shouldered not only by workers but also by health insurance companies (compensation providers), employers and the workers' families[1 2]. The compensation provider provides not only medical and compensation benefits to the employee, but is also responsible in many countries for comprehensive case management and coordination of the injured worker's return to work (RTW) [1 3 4].

Understanding the issues for employees in the RTW process is complex as it includes consideration of individual needs, social contexts (e.g. available support) and the work environment (e.g. modified equipment or work tasks) [5-7]. Returning to work is often a long process depending not only on the commitment, motivation, and physical and psychological health of the injured worker, but also on the types of support offered by the compensation provider, and the availability and skills of healthcare professionals, employer, peers, family members and the community [5-7]. It is important to understand workers' experiences and expectations so that stakeholders can best manage the RTW process.

The Malaysian context

The issue of how best to manage people with work-related injuries, such as those sustained in industrial and commuting accidents, has become increasingly important in growing industrial countries. In Malaysia the return to work (RTW) process began in 2008, when the Social Security Organization (SOCSO) implemented a bio-psychosocial RTW rehabilitation program coordinated by case managers. It has been welcomed by workers and employers alike who believe it is the government's social obligation to help injured workers who are actively contributing to their country [8]. Whilst a similar program in Hong Kong has demonstrated that case managers, acting as program coordinators, are very effective in promoting RTW and minimizing work disability,[9] it is not known what types of supports injured Malaysian workers experience and how these facilitate the RTW process.

In this study, we aimed to explore injured workers' experiences of the support they have received throughout the RTW process to assist case managers, therapists and stakeholders to provide the most appropriate services.

Methodology

Participants and Design

We used a qualitative, interpretative approach [10]. Potential participants were recruited via case managers or randomly chosen from the SOCSO database. All lived in the Klang Valley or Malacca regions which are known as industrial and tourism economies with mixed populations of Malays, Chinese and Indians. The study purpose was explained by the first author via telephone, and those who consented were interviewed at their at workplace, home, or SOCSO's nearest office. Participant details are summarized in Table 1

Table 1. Participant details

	Sex	Age	RTW phase	Body part injured	Ethnicity	Marital status	Accident type
1	M	28	maintenance	trunk	Malay	married	commuting
2	M	37	re-entry	lower limb	Malay	married	commuting
3	M	53	maintenance	upper limb	Chinese	married	industrial
4	M	29	off work	lower limb	Indian	single	commuting
5	M	32	advancement	lower limb	Malay	single	commuting
6	M	40	off work	multiple	Malay	single	commuting
7	M	39	maintenance	trunk	Malay	married	industrial
8	M	46	re-entry	trunk	Malay	married	industrial
9	F	38	maintenance	upper limb	Malay	single	commuting
10	F	54	maintenance	trunk	Indian	single parent	industrial
11	F	29	re-entry	lower limb	Malay	married	commuting
12	F	46	maintenance	upper limb	Indian	married	industrial
13	F	46	off work	trunk	Malay	married	industrial
14	M	26	re-entry	lower limb	Malay	married	commuting
15	M	38	off work	neck	Indian	married	commuting
16	M	36	re-entry	lower limb	Indian	single	commuting
17	M	48	off work	upper limb	Indian	married	commuting
18	M	29	advancement	lower limb	Malay	single	commuting
19	M	22	re-entry	head	Indian	single	industrial
20	M	38	off work	head	Malay	married	industrial
21	M	39	re-entry	trunk	Malay	married	industrial

M= male; F=female; RTW=Return To Work

Results

21 participants (16 male; 5 female) with a mean age of 37.76 years (range= 22-54) took part in this study. Roughly a third were off-work, a third were in the work re-entry phase, and the final third were either in the maintenance or advancement phase after returning to work. Key themes to emerge are grouped below according to the source of support.

Compensation provider

Insured workers' spoke both positively and negatively about their experiences with the compensation provider, SOCSO. Twelve participants spoke positively about SOCSO's benefits in terms of permanent and temporary disablement compensation. They reported that SOCSO not only paid a lump sum for injuries sustained but also hospital bills for surgery, aids, medications, and other expenses.
Three themes emerged from this category:

- *Flexibility in the RTW program by not fixing the number of session and duration of the treatment*
- *Reviewing the amount of compensation based on number of dependants and liabilities (etc car, house and personal loan)*
- *Education and awareness for the employer and employee in the claim process*

Case manager

Most participants reported a positive experience regarding the RTW program and they were happy with the case manager facilitating coordination with physicians and healthcare providers. Case managers were praised for assisting in the compensation process (e.g. claiming benefits). Conversely, some participants felt that case managers were unable to fulfill their commitments or appointments. Some participants were also not clear about the terms of their RTW program, and that there was not much communication or negotiation with the employer, and they believed that there was room to improve this situation.
Two key themes emerged:

- *Need for meeting with employers to discuss potential modification of equipment and adaptation of work tasks*
- *Need for clear information and communication regarding RTW program (e.g. number of sessions treatment, objective, maximum medical intervention)*

Employer

Participants' experiences differed depending on the employer. Seven participants talked about positive support from their employer (e.g. providing light duties, modified tasks or equipment). Some employers also provided moral support, such as visiting the injured person in hospital and providing counseling. Some employers paid for hospital admissions, operations, and loaned money for hospital bills and medications. Other employers paid workers salaries (full or half of the salary) for 2 to 6 months during their time off work. Furthermore some employers organized emergency plans for the injured worker and allowed time-off for further treatment when the person returned to work.
Two themes emerged from this category:

- *Need for financial and moral/psychological support*
- *Objective agreement between employers and employees in regards to modified equipment and adaptation of work tasks*

Family and colleagues

Family support from spouses, parents, children, siblings and relatives was regarded as very important during the RTW process. Family support not only involved assisting injured workers with daily chores, but also giving moral support, understanding the injured worker's problems and assisting with financial burdens. The impact that an injury has on personal relationships, including those with friends, family and partner, is important as it has implications for longer term support.
Two themes emerged from this category:

- *Family and friendship support and understanding is a key factor to surviving hardship especially for people with severe or permanent disability.*
- *Co-workers also play an important role especially when the injured worker is hospitalized or is in the process of returning to work.*

Healthcare providers

Almost all of the injured workers had a positive experience with healthcare providers, with many crediting physiotherapy interventions with improving their physical ability and pain. Some noted, however, that there was little advice available from occupational therapists when problems arose at work, and there were some negative experiences with healthcare providers.

All participants expressed concern about losing their job, and were worried that a therapist's report may jeopardize their job security by disclosing reduced work capacity. This is a particular concern for unskilled laborers in Malaysia, where there is a ready supply of immigrant workers due to its booming economy.
Three themes emerged from this category:

- *Need for more Occupational Therapy services at the workplace*
- *Appointments schedules must be honored and flexible to accommodate shift workers*
- *Guidelines needed to address insecurity raised by therapists/physician reports*

Other agencies

In Malaysia, the government welfare department can provide financial support to severely disabled workers who are subsequently unable to work. Injured workers with children whose spouse is not working are entitled to receive monthly financial assistance. There is also an Islamic religious department in Malacca that contributes some financial help to injured workers, and provides personal counseling to workers and their spouses.

Conclusion

In this study, case managers, healthcare providers, and families appeared to play the most important roles in the provision of support throughout the whole RTW process. Other important sources of support were SCSO, the employer, and community agencies. Issues raised for improvement of supports include clearer guidelines for employers (with formal recognition of the Case Manager's role) and protection of injured worker's rights.

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Chapter 8 Integrated discussion, conclusion and future research directions

8.1 Introduction to the chapter

In this chapter, I will discuss the overall conclusions from the research project. In the process, I will explore in detail the different interpretations of the results from the various studies from the different perspectives of outcome/variables (namely "occupational performance and participation", "activity limitations", "physical and mental health statuses", "emotional health" and "experiences and expectations of support" perspectives) and the potential impact this research will have on practice. This will include recommendations for the development of return to work guidelines and also suggestions for occupationally-based interventions to support RTW programs conducted by SOCSO for insured workers. Finally, I summarize the importance of the findings in this thesis and suggest some recommendations and areas for future research.

8.2 Discussion

From completing this research, I am now even more convinced that evaluating the effectiveness of a RTW program based only on the number of people returning to work gives only one dimension of the experience for workers in returning to work. This research demonstrates that a key aspect that is often overlooked is the injured worker's occupational performance and participation. In addition, it is very important to consider that workers' needs, occupational performance, and participation will vary according to RTW phase, and addressing these is issues is especially important for those who are in the off-work and re-entry phases.

The first study (Chapter 3) tested the reliability and validity of the Malaysian OSAv2.2, and whether it can be used to explore the current status of occupational performance and

participation in injured workers attending RTW programs (Murad et al., 2011). The results showed that the Malaysian OSAv2.2 is reliable and valid for exploring the level of occupational functioning among workers with a variety of MSDs, and with people from different ethnic, cultural and religious backgrounds in a Malaysian context (Murad et al., 2011).

The translation and establishment of the validity and reliability of the Malaysia OSAv2.2 will assist OTs and potentially other health professionals to assess and then provide interventions addressing occupational performance issues in Malaysian RTW programs (Murad et al., 2011). Furthermore, the OSAv2.2 was constructed specifically to measure the whole context of the person's (injured workers) life by knowing how well the person perceives their performance and how important it is to them (Kielhofner, Dobria, Forsyth, & Kramer, 2010). Understanding injured workers' occupational performance in context is vital so that we are able to discriminate the *effects* of the injury on occupational performance and the *needs* of individuals. Exploring the *needs* (that are related to basic tasks of living, managing life and relationships as well as satisfaction and enjoyment) is paramount and goes much further than simply understanding only the *effects*, such as inability to walk, carry groceries, or play sports.

Overall, it was found that most aspects of occupational performance and participation of the injured workers involved in this study were affected (Chapters 3 and 5). Although we found no significance differences between overall occupational competence those who attended the RTW program (mean=50.45, SD= 11.86) (Murad et al., 2012) and those who did not (mean=53.09, SD=10.38) (Murad et al., Submitted-b), we did find that, in comparison to the reference population (mean=57.19, SD=7.47) (Kielhofner et al., 2009), our participants'

occupational competence were significantly lower than expected (Murad et al., 2012). These findings may be explained by the fact that there was not much opportunity for participants to engage with the occupational therapists who would be more likely to focus on occupational performance and participation.

We also found (in Chapter 5) that injured workers who attended the RTW program demonstrated significantly lower health status when compared with the established normative Malaysian population scores (Murad et al., Submitted-a; SF-36v2™ Health Survey, 1998). In addition, their overall ratings for physical health were lower than for mental health. Further, when we segmented our data by the different phases of the RTW process, the participants who were in the off-work and re-entry phases were the most likely to be affected by their negative health status (Murad et al., Submitted-a). These findings emphasize the need to find the best strategy to overcome the negative health impacts of work-related MSD's. It is also interesting to note (Chapter 6) that participants' perceived occupational competencies varied across the different RTW phases, with significantly lower ratings in those injured workers who were in the off-work and re-entry phases (Murad et al., 2012). These are people who are unable to RTW, are still receiving medication and rehabilitation and currently being assessed for functional abilities, or who are just commencing working with modified tasks, or performing a job that has different requirements to reduce pain (Young et al., 2005).

Not surprisingly, in Chapter 4, which studied the association between occupational functioning and activity limitations, we found a moderate link with activities that required physical exertion ($0.37 \leq rho \leq 0.64$, $p < 0.05$) . For our participants (those who had declined a SOCSO programme, but were in the process of returning to work), physically demanding activities from the SF-36, such as lifting, carrying groceries, climbing stairs, bending,

kneeling, stooping and walking more than a mile were the most significant factors that related to lower occupational functioning. This association is possibly explained by the fact that participants in our sample were not receiving SOCSO assistance, and none were referred to occupational therapists. The specific items of occupational functioning that were affected most were: doing the things that they need to do physically, taking care of the place where they live and getting where they need to go. Finding satisfaction while spending time with friend or participating in sports. Feeling adequate on accomplish one's goal. This information added a new understanding of the specific areas of occupational functioning that are impacted upon, and expands on previous findings from other descriptive studies. These have reported only that workers had difficulty with their general occupational functioning, or experienced restricted roles and activities (Cromie et al., 2002; Jansson & Bjorklund, 2007). The consistency of the findings reflects that the issue of occupational performance and participation among workers with MSDs should not be ignored or taken for granted. Theoretical OT frameworks, such as MOHO, can be applied to support the current SOCSO's RTW programme and can build on and enhance the currently used biopsychological approach.

In Chapter 6, we found direct relationships between occupational competence and negative emotional states (Murad et al., 2012). Awareness of the individual's emotional state is important, as this is likely to impact on the success of their RTW programme. Furthermore, we found that workers who were in the early phases of RTW (off-work and re-entry) were the most likely to be affected. These groups may be the most vulnerable people that will experience problems with occupational performance and participation as well as personal issues such as financial and emotional issues (Alexander et al., 2007; Cromie et al., 2002; Jansson & Bjorklund, 2007; Murad & Farnworth, submitted; Soares & Grossi, 2000). This

finding was expected since these groups are either still receiving medication and rehabilitation and currently being assessed for functional abilities, or just commencing working with modified tasks, or in a job that has different requirements to minimize pain and avoid reinjures. Occupational functioning items that reflect the responsibilities of being a working adult with other life demands include taking care of the place where they live and those they are responsible for, being involved as a family member, and doing activities they like. All these items need to be addressed in a SOCSO RTW programme. Providing occupationally-based interventions, such as assessing the individual's interests, roles and routines and occupational performance/skills, has the potential to enrich the SOCSO RTW programme that currently focuses only on physical and pain problems of the injured workers.

The findings throughout this thesis have consistently shown how important it is to understand the injured worker's occupational performance and participation, a recommendation that has been emphasized in previous studies (Braveman, 1999; Jang, Li, Hwang, & Chang, 1998; Kielhofner et al., 1999; J. Lee & Kielhofner, 2010). Although negative emotional states such as stress, anxiety and depression have been associated with people with MSDs in previous studies (Alexander et al., 2007; Heuvel et al., 2007; Jonsson, 2000; Soares & Grossi, 2000) this has not been directly linked to poor occupational performance. Although the number of participants in our study is too small to be able to generalize the findings more broadly, the study serves as a critical foundation for exploring occupational performance and participation with people who have work related injuries who are at the same time experiencing emotional problems. Larger cohort studies, preferably with lengthy periods of follow-up (i.e. more than 2 years) so that participants can be tracked throughout the RTW phases, are needed to provide stronger evidence regarding the relationship between occupational functioning and emotional problems.

Model of Human Occupation (MOHO) versus International Classification of Functioning and Disability (ICF)

In the beginning of this thesis, the theoretical framework of MOHO and ICF was introduced. These theoretical frameworks lay an important foundation for understanding the individual *effects* and *needs* of injured workers due to their injuries that they have experienced. The ICF framework can guide health professionals to understand the individual *effects* of the disorders or injuries that they experienced, whereas the MOHO theoretical framework can guide OTs to focus beyond the effects to their actual *needs* in relation to a person's whole life which is about a person's occupation and health. The association between variables that was found based on the underpinning theoretical frameworks showed that links exist between these concepts, and strategic planning must be initiated to support the current SOCSO RTW programme. The links described in Chapters 4 and 6 were that occupational competence of the injured workers is moderately associated with activity limitations, participation restrictions and negative emotional states (Murad et al., Submitted-b; Murad et al., 2012).

When it comes to interpreting the overall results Chapters 4, 5 and 6, we cannot draw any specific conclusions regarding causality or the effectiveness of the programme, and this is an important limitation that must be acknowledged. These were all cross sectional studies, which provide a "snap-shot" at one particular time, and can therefore only report associations between variables of interest. In order to establish causal links, researchers need to track the same participants over a period of time or compare results with control groups (Bengt et al., 2003; Lotters et al., 2005; Sjostrom et al., 2008; Westman et al., 2006). In addition, research on the effectiveness of our variables of interest in RTW has either not been done on a large scale (e.g. a single case study) or has only measured the impact on actual RTW and activity of daily living (K. B. Baron & Littleton, 1999; Jang et al., 1998).

We are also unable to conclude that any significant improvements, especially in terms of occupational performance and functioning happened because of SOCSO's use of a biopsychosocial approach in their RTW programme. However, the preliminary findings of these studies provide a baseline that there is a significant difference in occupational competence, health status and negative emotional states when compared with other populations (e.g. people with various disabilities and Malaysian's general populations) and those who were in the off-work and re-entry phases are the most affected (Murad et al., Submitted-a, Submitted-b; Murad et al., 2012). These findings need further exploration using stronger methodologies (e.g. randomised trials) comparing the standard RTW programme to one which also includes occupationally-based interventions based on MOHO.

An exploration of the need for support from the worker's personal perspective (Chapter 7) highlighted the actual experiences of the injured workers and expectations they have with their stakeholders (Murad & Farnworth, submitted). It identified that SOCSO as a compensation provider needs to be more flexible in their RTW programme, especially for those who had returned to work and were doing shift work, and those with severe injuries (Murad & Farnworth, submitted). According to participants, the amount of compensation needs to be reviewed and based not only on the impact of the disability on their work life, but also their role as a sole breadwinner, having several dependants and other financial liabilities (i.e. personal loans, house and car loans). Another issue identified was the need for better education and raising awareness for insured workers and employers regarding benefits and compensation claims as some fellow workers or employers were unaware of all the benefits and compensation systems. Additionally, this study identified that case managers needed to extend their role by meeting with employers to discuss work limitations of the injured

workers and to resolve issues hindering them from returning to work. For example, participants suggested that case managers must give clear information and communication with the insured workers/employers regarding the objective of RTW so that they could have realistic expectations of what sorts of services are included in a RTW programme and what sorts of assistance the employers need to provide. In addition, according to the participants, the assistance could be improved if the employer created financial schemes to help their fellow workers and gave moral/psychological support to the employee. In terms of healthcare providers, participants expressed a need for them to extend their services at the workplace, and felt their advice on the modification of equipment and adaptation of the work tasks would benefit workers. They also noted that appointments schedules must be honoured, as cancellations were likely to lead to poor relationships with the injured workers. Feelings of job insecurity associated with therapists/physician reports must be solved at national level by having clear RTW guidelines that protect the rights of injured workers, and enable them to undertake RTW programmes in a safe manner that does not put them at risk of recurrent injuries or retrenchment. The research questions and results along with different interpretations in all aspects of this research project, as summarised in Table 3.

Table 3: The research questions and results along with different interpretations in all aspects of this research project

Research question	Result	Interpretation
Chapter 3. Is the Malaysian language version of Occupational Self-Assessment (OSA version 2.2) reliable and valid enough to be used with Malaysian injured workers population?	All items in the finalised Malaysian language version of the OSA version 2.2 except the item relating to 'Managing my basic needs (food, medicine)' showed acceptable reliability (internal consistency, corrected item correlation and test-retest reliability) and validity (convergent and discriminant validity)	The findings open the gate for exploring the level of occupational functioning among injured workers with a variety of MSDs, and with people from different ethnic, cultural and religious backgrounds in a Malaysian context.
Chapter 4. What are the levels occupational competence and its associations to activity limitations and participation restrictions amongst injured "unmotivated" workers who did not participate in a RTW programme?	The mean occupational competence in our sample was found to be significantly lower than the reference population Significant associations were found with most activity limitations measured by the SF-36 v2, with the strongest of these	The findings provide an argument for OTs to be involved with these injured workers. If the issue of occupational functioning is resolved the likelihood of individuals participating in SOCSO's RTW programme may be

	occurring with the item “bending, kneeling or stooping” (rho=0.64) and “carrying groceries” (rho=0.53). All participants rated the impact of their health problems on social activities as moderate to extreme.	higher.
Chapter 5. 1. What is the health status of injured workers who are participating in the Malaysian national RTW programme when compare to established norm-based populations?	Physical and mental health status components of the injured workers were below average compared to the normative Malaysian population. In addition, their physical functioning was rated lower than their mental functioning.	The findings provide evidence that the health status of the injured workers need to be explored further by providing new strategy on how to improve it.
2. What is the health status of the injured workers when compared across the different phases of RTW programme?	The health status of injured workers in the off-work and re-entry phases was significantly affected in comparison to people in other RTW phases.	Greater attention to health status is needed when injured workers are in the off-work and re-entry phases

Chapter 6. For injured workers participating in Malaysia's national RTW programme: 1. How does the overall level of occupational competence and psychological symptoms compare to normative data? 2. Are there differences in occupational competence and psychological symptoms across the different phases of RTW programme? 3. Is there an association between occupational competence and psychological symptoms overall and across the different phases of RTW programme?	This study demonstrates that injured workers' occupational functioning and emotional states were significant lower when compared to reference populations. Occupational competence needs to be addressed especially for those in the off-work and re-entry phases. The injured workers' occupational competence and negative emotional states were moderately linked.	This study supports the contention that OTs should become involved at the beginning of the RTW programme. Injured workers' interests, roles, routines and daily living skills should be focused on by service providers because these have links to emotional and physical well-being. We propose that occupationally -based interventions to support SOCSO's programme be introduced.
Chapter 7. 1. What are the experiences and expectations of	The findings indicate that workers who were their family's sole breadwinner, had low	Stakeholders' support for injured workers is important. RTW

support amongst injured workers participating in Malaysia's national RTW programme?	educational qualifications and employed in small and medium company represented those most affected by the RTW process. In terms of support required from specific stakeholders, the following themes emerged: *Compensation provider (SOCSO):* flexibility in RTW program, reviewing the amount of compensation and education and awareness. *Case manager*: meeting with employers and clear information and communication. *Employer*: financial and moral/psychological support from the employer and objective agreement between employers and employees. *Healthcare provider*: Extent services at	guidelines must be embedded in government regulations on workplace occupational health and safety issues to generate full and genuine participation and cooperation from all stakeholders.

	workplace, appointments schedule and feel insecure with therapists/physician report.	

8.3 Implications

Although SOCSO's RTW programmes provide support for injured workers, these have often been implemented without considering a substantial evidence-base for the interventions undertaken. This may lead to ineffective or unproductive approaches to intervention, and a sole focus on the achievement of short-term RTW targets without any overarching plan for avoiding interventions that may lead to unsustainable return to work, job dissatisfaction and low motivation. Such approaches are unlikely to promote meaningful change in people's quality of life or enhance health status and emotional wellbeing as much as other, more planned intervention programmes that are based on research evidence, such as those described in cohort and experimental studies conducted with Canadian, Swedish and China (Hong Kong) populations which were previously described in Chapter 2 (Lai & Chan, 2007; Lotters et al., 2005; Sjostrom et al., 2008; Westman et al., 2006).

The results from this research provide the basis to support the establishment of an increased focus on occupationally-based interventions with the purpose of supporting and enhancing the occupational performance and participation of the injured workers, as described in Chapters 4 and 6 (Murad et al., Submitted-b; Murad et al., 2012). Occupationally-based interventions are discussed in detail in the next section.

8.4 Occupationally-based intervention

This section outlines a proposed occupational-based intervention based on the results from this research (Murad et al., Submitted-a, Submitted-b; Murad et al., 2012) and other studies that relate to the MOHO theoretical framework in RTW (K. B. Baron & Littleton, 1999; Braveman, 1999; Kielhofner et al., 1999; J. Lee & Kielhofner, 2010). In addition, a recent systematic review by Desiron, de Rijk, Van Hoof and Donceel (2011) reported that although

there was sufficient evidence of occupational therapy interventions in rehabilitation programmes which contribute to RTW, it is still not clear what the effective ingredients are, apart from the workplace interventions described by Lambeek et al. (2010) which included graded activity intervention to restore function of the participants to RTW.

The proposed occupationally-based intervention is designed for implementation by the Certified RTW Occupational Therapist (CRTWOT) for injured workers through the SOCSO RTW programme network. The programme could also be provided by a range of other service providers (providing they were familiar with the underlying framework); however, minor alterations would be required, especially in the recruitment, screening and selection processes. This occupationally-based intervention based MOHO theoretical framework (Kielhofner, 2008; Kielhofner et al., 1999), addresses not only the injured workers volition but also their habituation, including roles and routines. In addition their performance/skills will be explored with attention to their activities of daily living as well as their job performance at the workplace. Environmental contexts, such as the personal, physical and socio-cultural, also require further consideration (Kielhofner, 2008; Kielhofner et al., 1999) . In addition, other interventions that have been proven effective also will be incorporated, such as ergonomic assessment and intervention (Verhagen et al., 2006) along with workplace intervention comprised of education about stress management, and principles of ergonomics (Aas et al., 2011; Bengt et al., 2003). Much of the time of CRTWOT will spent in the injured workers own environment. At this stage CRTWOT will aim to enhance and improve the worker's performance/skill, habituation and volition by assessing, negotiating, training, motivating, exploring and consulting (Townsend & Polatajko, 2007) .

8.4.1 Screening and selection

Based on the demonstrated utility, reliability, and validity of the OSAv2.2 with injured workers in the Malaysian context (Murad et al., 2011), this tool should be included in the screening process. As stated previously, this measures occupational performance and participation (competence and value), and could be used in combination with assessments that measure health and emotional state such as the Health Surveillance Survey (SF36v2) (Ware et al., 1996) and the Depression Anxiety and Stress Scale (DASS-21) (Lovibond & Lovibond, 1995). Those participants who demonstrate poor occupational competence with the 21 items, either because they "have a lot problems" or "have some difficulties" doing their occupational performance and participation, and who demonstrate report poor health and higher scores for depression, anxiety or stress, should be prioritised for intervention. The proposed cutoffs are: Occupational competence scores below 50 (as measured by OSA 2.2) and scores above 10 for depression, 5 for anxiety and 9 for stress (as measured by DASS-21). In addition, priority must be given to the items rated "more important" or "the most important" by participants. For example, if the item regarding his/her home life is rated more important, the CRTWOT will need to prioritise this.

Given the importance of the work environment, a measure of the impact of this on the workers experience, and how this can facilitate or challenge performance should also be collected at baseline and again after intervention so that it can be used as an outcome measure for injured workers who complete the intervention. One such instrument that can be used to identify the work environment is Worker Environment Impact Scale (WEIS) version 2.0 (Moore-Corner, Kielhofner, & Olson, 1998), which has been developed using MOHO theoretical framework.

The WEIS allows the injured worker and therapist to identify environmental characteristics that facilitate successful employment experiences. Factors that inhibit worker performance and satisfaction, and which may require accommodation, are also addressed to maximize the "fit" of the worker and their skills to the job environment. The WEIS is a semi-structured interview and rating scale designed to assist the therapist to gather information on how individuals with physical disabilities experience and perceive their work environments. In this assessment, therapists will identify injured workers who are experiencing difficulty on the job. The 17 items reflect the social and physical environment, supports, temporal demands, objects used, and daily job functions. The rating scale is structured accordingly: 4 = strongly supports, 3= supports, 2= interferes and 1 = strongly interferes. The scale will assist the therapist to identify environmental qualities that facilitate or inhibit the injured worker's RTW. Based on this assessment, therapists can then recommend reasonable adjustments for injured workers' RTW plan. Discussion and mutual goal setting between the therapist and injured worker can be set for the injured worker to pursue with the support of the organisation.

This occupationally-based assessment may not be suitable for injured workers with serious or higher negative mental states. Although not clearly identified in this study we suggest that other professional help, such as psychologists or psychiatrists, may be required.

It is important to target interventions to injured workers who are in the off-work and re-entry phases of RTW because, as was indicated in Chapter 4 and 6, workers in these phases are the most affected (Murad et al., Submitted-b; Murad et al., 2012), and are the most vulnerable at this point (Murad et al., Submitted-b; Murad et al., 2012). The workers who have recently returned to work are likely to be experiencing recurrent symptoms or disabilities (for example pain, restricted activity, physical and mental functioning limitations) which may be causing them to take time off from normal working hours.

8.4.2 Intervention planning and goal-setting

At the initial meeting between CRTWOT, the future participants (injured workers) and employers, it is important to describe the theoretical basis of the occupationally-based intervention, as it is likely that, without such explanation, many would perceive support to engage in "occupationally-based intervention" only to be a "privilege" or "opportunity" or "benefit" for extra attention with their injuries or personal problems (i.e. financial problems). Without the employers' participation and understanding, injured workers are less likely to be supported with these issues, as found in previous studies that employer involvement is more effective and cost effective for RTW in adults with musculoskeletal conditions (Carroll et al., 2010). Participants should be informed that the interventions are intended to be useful to support improvements in their occupational performance and participation, health status, emotional wellbeing and work environment which may all contribute towards a more comprehensive and sustainable return to work. As mentioned previously, occupationally-based interventions include person related factors such as volition, habituation, and performance/skills.

Participants should also be encouraged to continue attending physiotherapy services, and other RTW programmes simultaneously. If, at this stage, participants cannot be convinced of the potential contribution of these interventions, then it may be worthwhile considering exiting the individual from the programme as it is unlikely that, without active engagement, the intervention will be successful. Active participation and voluntarily engagement in a programme which is purposeful and meaningful to the injured workers are vitally important, according to the Canadian Occupational Therapy Association (CAOT) in its guidelines for client-centred practice (Polatajko, 2004; Polatajko, Mandich, & Martini, 2000)

and is consistent with the Canadian Model of Client-Centred Enablement (CMCE) (Townsend & Polatajko, 2007).

The research described in Chapter 4 (Murad et al., Submitted-b) provide the foundation for activities that are likely to be most beneficial. The most essential elements of occupational functioning found in this study were "doing the things that (they) need to do (physically)", "taking care of the place where (they) live" and "getting where (they) need to go". Other areas that were identified in this study that related to habituation for injured workers in the off-work phase were doing activities that they like and using their abilities effectively. However, the most important element of choosing an occupational functioning issue to address is that they are considered important and meaningful by the injured worker (Polatajko, 2004; Polatajko et al., 2000; Townsend & Polatajko, 2007). The establishment and achievement of personally important and meaningful occupational functioning goals is associated with improved emotional state, and encourages the injured worker to set and achieve further goals (Murad et al., 2012; Polatajko, 2004; Polatajko et al., 2000; Townsend & Polatajko, 2007).

8.4.3 Implementation of plans and achievement of goals

The establishment of detailed plans will assist the injured worker in determining how to go about achieving the goals that they identified. Goal achievement may be demanding and challenging, and supports such as pre-planned calls to the worker's mobile phone or the use of a personal diary to remind the injured worker of planned actions may be crucial. To facilitate the change process, a sense of optimism and expectation must be maintained and challenges or barriers should not be seen as "obstacles," but rather as bits and pieces in need of reconsideration. For example, perhaps the "pace" may have been too much, or the plans

were not linked as well as they should be with the injured worker's inner expectations or needs. Perhaps different strategies to optimise the change process may be needed, and the application of the stages-of-change model may assist practitioners (Prochaska, DiClemente, & Norcross, 1992). This model suggests that the change process varies at different stages and it is important to understand and assess the stage of injured worker‘s readiness for change and to match interventions accordingly (Prochaska et al., 1992). In addition, the Lam Assessment of Stages of Employment Readiness (LASER) that was developed for use on workers who had gone through RTW process could be used to understand the stage of injured worker's readiness for change (Lam, 1997; Prochaska et al., 1992).

Regular meetings (preferably weekly) should be established to assess progress towards goals. When goals are achieved, further goals should be established. The goal setting process should be mutually agreed between the support person and the injured worker. This will sustain the injured worker to maintain the relationship with the supporter and at the same time take on greater accountability towards developing and achieving goals.

8.4.4 Evaluation

There are three main aspects related to evaluation which are outcome, process and satisfaction (Verbeek, 2004). Each of these will be discussed with reference to findings from this research and potential measurement tools for each aspect.

8.4.4.1 Outcome

The primary desired outcome for this occupationally-based intervention programme would be the improvement in the worker's occupational performance and participation, physical and mental health status and emotional wellbeing, so the key outcome measures (as demonstrated

in the included studies) should be the OSAv2.2 (K. Baron et al., 2006) (Murad et al., 2011) , SF36v2 (Ware et al., 1996) and the DASS-21 (Lovibond & Lovibond, 1995). The research guiding the development of this intervention focused on occupational competency, physical and mental health status and negative emotional state (subscales of stress, depression and anxiety) improvements. The secondary measures of achievement of employment outcomes and reduction in work disabilities will also be important, especially for programmes that are linked through the Malaysian SOCSO return to work programme network. Measures of employment outcome reported in previous studies have included actual RTW numbers, days of sick leave, pain intensity, health care consumption and costs, functional status and quality of life (Bengt et al., 2003; Lotters et al., 2005; Sjostrom et al., 2008; Westman et al., 2006). These measures are important and need to be included along with the above occupational measures as they will assist us to quantify the impact of occupationally-based interventions on the achievement of employment outcome or reduction in work disabilities.

8.4.4.2 Process

The main strategy of this occupationally-based intervention programme is to enhance or improve the occupational performance and participation of injured workers and, in doing so, to promote a better sense of physical and mental health and emotional wellbeing. Therefore the OSAv2.2 (as the measure of occupational competency) and these selected physical and mental health and emotional wellbeing (as measure by SF36v2 and DASS-21) can be used as “process” evaluation measures. At the completion of the programme, it is hoped that participants are able to demonstrate enhanced or improved “occupational competency” as well as other parameters of “physical and mental health and emotional wellbeing”.

8.4.4.3 Satisfaction

As with any intervention programme, it is important to evaluate the perceptions of injured workers engaged in the occupational-based RTW programme. Key elements of such a satisfaction measure should include questions about the connection with the immediate occupationally-based RTW programme provider (CRTWOT) (e.g. was the provider accommodating your day-to-day activity needs? Did she/he help you to start again when things did not go as intended?, did she/he maintain an encouraging attitude?); quality of plans developed; access to resources needed to achieve goals; the individuals' perceptions of how successful the intervention was in enhancing their day-to-day functioning , health status, and emotional wellbeing and suggestions for improvements.

8.5 Return to work guidelines

This section outlines proposed guidelines for return to work programmes in Malaysia based on findings from studies completed in this thesis. The guidelines are designed to be implemented by RTW service providers to support injured workers through the SOCSO's RTW programme network. The guidelines proposed are for those people who will be involved directly with RTW programme such as injured workers, health providers (e.g. the CRTWOT) and the injured worker's employer. Whilst the research undertaken for this thesis provides a foundation for change (Murad & Farnworth, submitted), to be able to enforce these guidelines, it is important that they are embedded within either the Malaysia's Occupational Health and Safety Act 1994 or Social Security Act 1969. To do this, we need to a lobby the Malaysian Occupational Therapists Association (MOTA) and Ministry of Health to discuss and eventually implement an agreed version of these guidelines. It will also require more work at a policy level with Malaysian Ministry of Human Resources.

The occupationally-based intervention can be provided by OTs who have additional education and training to achieve a minimum level of competence in the provision of RTW programmes. This could be provided through a postgraduate certificate specialist course in Occupational Therapy which specializes in occupational health and vocational rehabilitation. In addition, it will also require therapists to have experience in working with people with physical disabilities and some involvement with SOCSO case managers.

8.5.1 Employer

As recommended in Chapter 7, information should be given by the SOCSO case manager to the employer regarding the support and assistance that they need to provide for their injured workers in the RTW programme (Murad & Farnworth, submitted). Information regarding the worker's current physical abilities and limitations, work status (availability to return to current work or new work area), financial assistance needed, any continuing intervention at hospital should also be provided. In addition, they need to have a full commitment to engage in the RTW programme with their injured workers as soon as possible. For larger employers, this can be done by setting up an occupational rehabilitation committee at the workplace as soon as work-related injuries are identified and/or when there is medical leave of more than 20 working days (Victorian WorkCover Authority, June, 2005). In addition, the employer needs to stipulate the return to work obligations in their organisation's policy (Tullar et al., 2010; Victorian WorkCover Authority, June, 2005). This should include the appointment of a return to work coordinator at a senior level (for example the manager of health and safety department) who has been trained in occupational rehabilitation at Malaysia National Institute Occupational Safety and Health (NIOSH). Early communication must be made with CRTWOT regarding the worker's current work capacity (certified by health providers at hospital based after doing functional capacity evaluation (FCE)) and assistance required to

return to work (Victorian WorkCover Authority, June, 2005). A plan and implementation of the worker's return to work programme must be documented after discussion with the RTW work coordinator, CRTWOT and injured worker. The outline of the plan and implementation is below:

- Relevant information must be provided to CRTWOT regarding pre-injury tasks, work station and work environment (for the purpose of CRTWOT to assess the risk of recurrent injuries or whether the current task/job suitable for the worker). At this point assessment such Worker Environment Impact Scale (WEIS) version 2.0 may be undertaken (Moore-Corner et al., 1998) if the CRTWOT feels it is necessary. The CRTWOT may also arrange a work site assessment/ergonomic evaluation at this point.
- Provide reasonable workplace supports, aids and modifications (recommended by CRTWOT). Implementation of these is dependent on the employer's current financial ability, and the CRTWOT will aim to recommend solutions that are affordable by the employer.
- Consult with CRTWOT and injured worker about the worker's return to work plan
- Provide clear, accurate, current details to the worker and CRTWOT about the RTW arrangements
- Support and monitor the worker and RTW arrangements
- Revise planning regularly throughout the RTW process
- Plan full RTW where possible, for example targeted date to accomplish full or modified duties/hours, who's responsible for risk assessment, targeted date to supply assistive devices and modification of the equipment and work tasks.

8.5.2 Certified RTW Occupational therapists (CRTWOT)

The role and nature of practice of the CRTWOT must be differentiated from other occupational therapy practices. It is recommended that a minimum standard or guideline of practice throughout Malaysia is established. The CRTWOT must be competent to:

- Accommodate/enhance occupational performance and functioning of the injured worker in areas such as activity of daily living, job performance/skill, role and routine and managing life and relationships. Current occupational performance can be assessed using OSAv2.2, as it can detect any problems regarding their current occupational life.
- Accurately identify risks, needs and abilities of the worker and workplace through worksite visits, consultation with the injured worker, employer and treating professionals. The WEIS may be introduced to gather information on how individuals experience and perceive their work environments. In this assessment, therapists will identify injured workers who are experiencing environment related difficulties on the job. Specific assessment may will be conducted, such ergonomics, hazard and manual handling checklists, depending on the injured workers needs and the job tasks that they were involved with.

Evidence shows that intervention at the workplace is efficacious and cost effective in terms of reducing sick-leave and pain, improving quality of life and health, and achieving functional restoration (Aas et al., 2011; Bengt et al., 2003; Martimo et al., 2009). The specific roles that CRTWOT should do at workplace are:

- designing and implementing return to work interventions to address the risks and match the needs and abilities of the worker and workplace

- negotiating, monitoring and adapting suitable duties to upgrade the worker's capacity to perform their pre-injury duties
- advising on workplace or work process modifications
- organising the supply of assistive equipment and ensuring the worker can safely utilise the equipment
- rehabilitation counselling and support to maintain the worker's motivation to return to work
- regularly and actively reviewing the goals and progress towards return to work
- assessing the worker's vocational capacity and potential through vocational assessment and counselling (if unable to return to former employment).

8.5.3 Employee (insured or injured worker)

Information on the benefits of and obligations for getting back to work after an injury is important to the injured worker. As found in Chapter 7, lack of communication and high expectations about the RTW programme are factors that are linked to low satisfaction with the RTW programme (Murad & Farnworth, submitted). They should be informed that they will be assisted through the return to work process by a CRTWOT. They need to understand in detail about what they can do on their *Certificate of Capacity* that has been signed off by the health providers. Another issue found in Chapter 7 was that injured workers were scared to voice their opinion regarding their limitations, as they were concerned that they would be terminated from their current job or that the employer would look down on them (Murad & Farnworth, submitted). They need to understand that they have a right to talk to their employer about their progress and the parts of their job that they think they can do for example in the guideline that has developed by Victorian WorkCover Authority, Australia for

their injured workers (Victorian WorkCover Authority, July, 2010). The injured worker is obliged to:

- Make reasonable efforts to RTW in suitable or pre-injury employment.
- Make reasonable efforts to actively participate and cooperate in planning for their return to work.
- Actively use a CRTWOT if provided, and cooperate with the provider of the RTW service.
- Actively participate and cooperate in assessments of their capacity for work, rehabilitation progress or future employment prospects.

8.6 Summary of the thesis

This thesis provides depth and preliminarily evidence regarding injured workers' occupational performance and participation across the different RTW phases. Personal factors, such as volition, habituation and performance skills, and the environmental context, such as support from stakeholders, are important factors that need to be taken into account in the RTW process. Health providers such as Occupational Therapists and case managers need to strategise the provision of services according to the injured worker's needs and priorities in order to have an impact on health status and emotional wellbeing. This thesis contends that occupationally-based interventions could have a positive effect on the health status and emotional wellbeing of the injured workers who are in the process of RTW (Murad et al., Submitted-a; Murad et al., 2012). It is recommended that efforts be particularly targeted at people who are in off-work and re-entry phases, as they are the most affected in terms of occupational performance and participation (Murad et al., 2012).

Considered as a whole, the findings in this thesis suggest that occupationally-based interventions should focus initially on uncovering and encouraging participation in those activities that individuals "want to" or "have to" engage in. At the same time as assisting the individual to develop a strong foundation of occupational functioning, support services should also focus on developing guidelines for RTW that provide access to the appropriate health professionals and engage the employer.

In addition, these RTW guidelines need to emphasize collaboration and commitment between injured workers, employers and RTW health providers and must be implemented at national level to ensure full participation and successfulness in RTW process. Future studies are warranted to provide strong evidence (e.g. randomised trials or cohort studies with adequate follow-up periods) regarding occupationally-based intervention as mentioned in this research to complement the current RTW programme.

8.6.1 Limitations

In addition to the limitations associated with the cross-sectional nature of this research project, a number of other limitations should be highlighted. The first of these is the nature of the sample. Participants in this project only included individuals from a specific project of RTW programme conducted by SOCSO. Individuals who were involved with other RTW programmes conducted by OTs, other health professionals, or other specific organizations (such as hospital-based RTW programmes) were not included. The limited inclusion of the sample means that a number of sample biases may be present, and the findings from this research, without further investigation, may not be applicable to the wider population of injured workers in Malaysia.

Secondly, the method of recruitment by survey may only have attracted those individuals who were health conscious, not actively engaged with work tasks, and able to understand Malaysian language questionnaires. We may have unintentionally excluded those individuals who were highly active (as they were too busy to complete the survey questionnaire) or had difficulty understanding the Malaysian language questionnaires.

Other limitations have been discussed in more detail with relation to each individual study. These include the method used to categorize their RTW phase, current abilities and capacities (i.e. self-report), which may have affected the reliability of the findings.

8.6.2 Conclusion and suggestions for future research

The key message from this research is that addressing the occupational performance and participation of the injured workers when they are in the process of RTW is important. In addition, other related elements such as negative emotional states, health status, activity limitations and participation restrictions need to be recognized as there is evidence of moderate associations with occupational performance and functioning.

Given that this research was conducted with a sample of injured workers who were able to comprehend language questionnaires that been written only in Malay language, further investigations should replicate this research with other populations, including those with low education background or from different ethnic backgrounds. Future research efforts in Malaysia could include questionnaires translated into other ethnic languages, such as Indian and Chinese. This is to ensure that future studies are applicable to a diverse set of ethnic populations. Other options that may capture data from people with low literacy may include

face-to-face interviews with participants potentially sourced from referrals by case managers or health providers.

Additionally, the proposed policy or guideline should be embedded in legislative acts or regulations that currently exist in the Malaysian context as described in this chapter. The aim of this is to ensure coordinated and genuine participation among stakeholders who were involved in the RTW programme. Furthermore, the proposed occupationally-based intervention model for injured workers should be implemented and evaluated as described in this chapter. The results of such a trial would provide further evidence to support (or refute) the recommendations from this research. If such programmes were proved to be successful in supporting RTW outcomes with injured workers, this would mark a remarkable enhancement in the evidence base for RTW support services.

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Appendices

Appendix 1: Ethics and Institution Approval

Project	Approval date, Institution/Organization, number and page reference			
	Approval date	Institution/Organization	Number	Page reference
Validation of instruments in Malaysia	26th August 2009	Monash University Human Research Ethics Committee	CF09/1353-2009000718	272
Perception of injured workers regarding return to work	17th June 2010	Monash University Human Research Ethics Committee	CF10/0618 - 2010000298	273
Perception of injured workers regarding return to work	2nd June 2010	Ibu Pejabat Pertubuhan Keselamatan Sosial	N/A	274
Perception of injured workers regarding return to work	7th June 2010	Economic Planning Unit, Prime Minister Department, Malaysia	UPE: 40/200/19/2647	275-276
Permission to translate Occupational Self Assessment version 2.1	26th August 2009	Model of Human Occupation Clearing House	N/A	277-278

MONASH University

Monash University Human Research Ethics Committee (MUHREC)
Research Office

Human Ethics Certificate of Approval

Date:	**26 August 2009**
Project Number:	**CF09/1353 - 2009000718**
Project Title:	**Effectiveness of Return to Work (RTW) programme for musculoskeletal disorders injured workers. Validation of instruments in Malaysia**
Chief Investigator:	**Assoc Prof Louise Farnworth**
Approved:	**From: 26 August 2009 To: 26 August 2014**

Terms of approval

1. The Chief investigator is responsible for ensuring that permission letters are obtained, if relevant, and a copy forwarded to MUHREC before any data collection can occur at the specified organisation. **Failure to provide permission letters to MUHREC before data collection commences is in breach of the National Statement on Ethical Conduct in Human Research and the Australian Code for the Responsible Conduct of Research**.
2. Approval is only valid whilst you hold a position at Monash University.
3. It is the responsibility of the Chief Investigator to ensure that all investigators are aware of the terms of approval and to ensure the project is conducted as approved by MUHREC.
4. You should notify MUHREC immediately of any serious or unexpected adverse effects on participants or unforeseen events affecting the ethical acceptability of the project.
5. The Explanatory Statement must be on Monash University letterhead and the Monash University complaints clause must contain your project number.
6. **Amendments to the approved project (including changes in personnel):** Requires the submission of a Request for Amendment form to MUHREC and must not begin without written approval from MUHREC. Substantial variations may require a new application.
7. **Future correspondence:** Please quote the project number and project title above in any further correspondence.
8. **Annual reports:** Continued approval of this project is dependent on the submission of an Annual Report. This is determined by the date of your letter of approval.
9. **Final report:** A Final Report should be provided at the conclusion of the project. MUHREC should be notified if the project is discontinued before the expected date of completion.
10. **Monitoring:** Projects may be subject to an audit or any other form of monitoring by MUHREC at any time.
11. **Retention and storage of data:** The Chief Investigator is responsible for the storage and retention of original data pertaining to a project for a minimum period of five years.

[redacted]

Professor Ben Canny
Chair, MUHREC

cc: Miss Lisa O'Brien, Mr Mohd Suleiman Murad

Postal – Monash University, Vic 3800, Australia
Building 3E, Room 111, Clayton Campus, Wellington Road, Clayton
Telephone +61 3 9905 5490 Facsimile +61 3 9905 3831
Email muhrec@adm.monash.edu.au www.monash.edu/research/ethics/human/index/html
ABN 12 377 614 012 CRICOS Provider #00008C

MONASH University

Monash University Human Research Ethics Committee (MUHREC)
Research Office

Human Ethics Certificate of Approval

Date:	**17 June 2010**
Project Number:	**CF10/0618 - 2010000298**
Project Title:	**Perception of injured workers regarding return to work**
Chief Investigator:	**Assoc Prof Louise Farnworth**
Approved:	**From: 17 June 2010 to 17 June 2015**

Terms of approval

1. The Chief investigator is responsible for ensuring that permission letters are obtained, if relevant, and a copy forwarded to MUHREC before any data collection can occur at the specified organisation. **Failure to provide permission letters to MUHREC before data collection commences is in breach of the National Statement on Ethical Conduct in Human Research and the Australian Code for the Responsible Conduct of Research**.
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[redacted]

Professor Ben Canny
Chair, MUHREC

Cc: Lisa O'Brien; Mr Mohd Suleiman Murad;

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PERKESO

Rujukan Tuan :
Rujukan Kami :
Tarikh : 2nd. June, 2010

Associate Professor Louise Farnworth
School of Primary Health Care
Head of Occupational Therapy Department
Faculty of Medicine, Nursing and Health Sciences
PO Box 527, Frankston, VIC 3199, Australia
Building G, Peninsula Campus, McMahons Road, Frankston

Dear Associate Professor Louise Farnworth,

Permission Letter for Research Project Title "CF10/0618 - 2010000298: Perception of injured workers regarding return to work"

Thank you for your request to recruit participants from Social Security Organization, Malaysia for the above-named research.

I have read and understood the Explanatory Statement regarding the research project and hereby give permission for this research to be conducted.

I recommend that a full report regarding the outcomes will be submitted to SOCSO organization as soon as the research project completed.

Yours sincerely,

[redacted]

(DR[redacted]ZMAN BIN AZIZ MOHAMMED)
Sen[redacted]ager Operation,
Social Security Organization,
281,Jalan Ampang ,
50538 Kuala Lumpur
Malaysia.
Tel: 60342563528 Mobile: 60193588999
Email: drazman@perkeso.gov.my

UNIT PERANCANG EKONOMI
Economic Planning Unit
JABATAN PERDANA MENTERI
Prime Minister's Department
BLOK B5 & B6
PUSAT PENTADBIRAN KERAJAAN PERSEKUTUAN
62502 PUTRAJAYA
MALAYSIA

EPU

Telefon : 603-8888 3333
Telefax : 603-888

Ruj. Tuan: Your Ref.: UPE: 40/200/19/2647

Ruj. Kami: Our Ref.:

Tarikh: Date: 07 Jun 2010

Mohd Suleiman Murad
[redacted]
Email: [redacted]

APPLICATION TO CONDUCT RESEARCH IN MALAYSIA

With reference to your application, I am pleased to inform you that your application to conduct research in Malaysia has been *approved* by the **Research Promotion and Co-Ordination Committee, Economic Planning Unit, Prime Minister's Department.** The details of the approval are as follows:

Researcher's name : **MOHD SULEIMAN MURAD**

Passport No. / I. C No: [redacted]

Nationality : **MALAYSIAN**

Title of Research : **"PERCEPTION OF INJURED WORKERS REGARDING RETURN TO WORK"**

Period of Research Approved: **4 YEARS**

2. Please collect your Research Pass in person from the Economic Planning Unit, Prime Minister's Department, Parcel B, Level 1 Block B5, Federal Government Administrative Centre, 62502 Putrajaya and bring along two (2) passport size photographs. You are also required to comply with the rules and regulations stipulated from time to time by the agencies with which you have dealings in the conduct of your research.

3. I would like to draw your attention to the undertaking signed by you that you will submit without cost to the Economic Planning Unit the following documents:

a) A brief summary of your research findings on completion of your research and before you leave Malaysia; and

b) Three (3) copies of your final dissertation/publication.

4. Lastly, please submit a copy of your preliminary and final report directly to the State Government where you carried out your research. Thank you.

Yours sincerely,

(**MUNIRAH ABD. MANAN**)
For Director General,
Economic Planning Unit.
E-mail: munirah@epu.gov.my
Tel: 88882809
Fax: 88883961

ATTENTION

This letter is only to inform you the status of your application and **cannot be used as a research pass**.

Model of Human Occupation CLEARINGHOUSE

Department of Occupational Therapy (MC 811)
University of Illinois at Chicago
1919 West Taylor St
Chicago, IL 60612
312- 413- 7469
fax- 312- 413- 0256

Permission to Translate for Research

I am requesting permission to translate the assessment listed below for personal research purposes only. The limits of this permission include:

- I may only use this translation in my personal research
- I will provide a plan of my use of this assessment
- I will not share this translation with other clinicians
- I am not given copyrights for this assessment
- I will not be listed as the official translation on the MOHO Clearinghouse Website
- Refer to all other stipulations as discussed by the "Policy Governing Translation Agreements" document.

Contact Information:

Assessment (with Version): Assessment form for Occupational Self Assessment v2.2

Address: Department of Occupational Therapy
School of Primary Health Care
Faculty of Medicine, Nursing and Health Sciences
PO Box 527, Frankston, VIC 3199, Australia

Phone number: [redacted]

Email: [redacted]

[redacted]

Signature Mohd Suleiman Murad — Date: 25. August 2009

[redacted]

MOHO Clearinghouse Signature — Date: 8/26/09

Appendix 2: Conference and Seminar participation

Conference presentations

Murad, MS., Farnworth, L., and O'Brien, L. Psychometric properties of Occupational Self Assessment for injured workers with musculoskeletal disorders. Presented at ASEAN Conference on Environment-Behaviour Studies, 7-8 July 2010, Kuching, Serawak, Malaysia.

Murad, MS., Farnworth, L., and O'Brien, L .Translation, reliability and validation properties of the malaysian language version of the occupational self assessment version 2.2 for injured workers with musculoskeletal disorders. Presented at The 5th Asia Pacific Occupation Therapy Congress (APOTC2011), The Empress Convention Centre on 19 – 24 November 2011, Chiang Mai, Thailand

Murad MS, Farnworth L, O'Brien L, Chien C. The impact of return to work programs on the health status of injured workers with work-related musculoskeletal disorders: a Malaysian study. Presented at Scientific Conference on Occupational Safety and Health (SCI-COSH), 12 – 13 December 2011, NIOSH, Bandar Baru Bangi, Selangor, Malaysia

Murad MS, Farnworth L, O'Brien L, Chien C.The impact of return to work programs on the health status of injured workers with work-related musculoskeletal disorders . Presented atThe 5th Asia Pacific Occupation Therapy Congress (APOTC2011), The Empress Convention Centre on 19 – 24 November 2011, Chiang Mai, Thailand

Murad MS, Farnworth L, O'Brien L, Chien C. The occupational competence and its relationship with psychological symptoms among injured workers with work-related musculoskeletal disorders in return to work programme. Presented at The 5th Asia Pacific Occupation Therapy Congress (APOTC2011), The Empress Convention Centre on 19 – 24 November 2011, Chiang Mai, Thailand

Murad MS, Farnworth L, O'Brien L, Chien C. Occupational competence and its relationship to psychological symptoms among injured workers with work-related musculoskeletal disorders in return to work programmes: A Malaysian study. Presented at The 9th COTEC Congress of Occupational Therapy, 24-27 May 2012 in Stockholm, Sweden.

Conference poster

Murad, MS., Farnworth, L., and O'Brien, L. The prevalence of occupational functioning, perceived competence measured through the Occupational Self Assessment and its association with pain, psychological symptoms, activity limitations and participation restrictions among injured workers with musculoskeletal disorders. Presented at OT Australia Victoria 2010 State Conference, Transitions & Transformation Developing Through Change, 12 & 13 November, MCG, Melbourne, Australia

Murad MS, Farnworth L, O'Brien L, Chien C. Investigating occupational functioning of injured workers with musculoskeletal disorders and its relationships with pain, psychological symptoms, activity limitations and participation restrictions. Presented at The 5th Asia Pacific

Occupation Therapy Congress (APOTC2011), The Empress Convention Centre on 19 – 24 November 2011, Chiang Mai, Thailand

Murad MS, Farnworth L, O'Brien L. Personal experiences and expectations of support in the process of return to work from injured worker with work- related injuries: An explanatory study. Presented at The 9th COTEC Congress of Occupational Therapy, 24-27 May 2012 in Stockholm, Sweden

Seminar & Workshop

Murad MS, Farnworth L, O'Brien L, Chien C The impact of return to work programs on the health status of people with work-related musculoskeletal disorders. Presented at Functional Capacity Evaluation Workshop. 26 &27 May 2011, Auditorium Putrajaya Hospital (35 Occupational Therapists throughout Malaysia). Main Speaker

Murad MS, Farnworth L, O'Brien L, Chien C Occupational competence and its relationship to psychological symptoms among workers with work-related musculoskeletal disorders in return to work programmes. Presented at return to work workshop. 13 & 14 November 2011, Seminar room, Sultanah Bahiyah Hospital, Alor Star, Kedah, Malaysia (30 Occupational Therapists throughout Malaysia). Main speaker

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Occupational Self Assessment
Myself

Name: _____ Date: _____

Step 1: Below are statements about things you do in everyday life. For each statement, circle how well you do it. If an item does not apply to you, cross it out and move on to the next item.					Step 2: Next, for each statement, circle how important this is to you.				Step 3: Choose up to 4 things about yourself that you would like to change (You can also write comments in this space)
	I have a lot of problem doing this	I have some difficulty doing this	I do this well	I do this extremely well	This is not so important to me	This is important to me	This is more important to me	This is most important to me	I would like to change
Concentrating on my tasks	lot of problem	some difficulty	well	extremely well	not so important	important	more important	most important	
Physically doing what I need to do	lot of problem	some difficulty	well	extremely well	not so important	important	more important	most important	
Taking care of the place where I live	lot of problem	some difficulty	well	extremely well	not so important	important	more important	most important	
Taking care of myself	lot of problem	some difficulty	well	extremely well	not so important	important	more important	most important	
Taking care of others for whom I am responsible	lot of problem	some difficulty	well	extremely well	not so important	important	more important	most important	
Getting where I need to go	lot of problem	some difficulty	well	extremely well	not so important	important	more important	most important	
Managing my finances	lot of problem	some difficulty	well	extremely well	not so important	important	more important	most important	
Managing my basic needs (food, medicine)	lot of problem	some difficulty	well	extremely well	not so important	important	more important	most important	
Expressing myself to others	lot of problem	some difficulty	well	extremely well	not so important	important	more important	most important	
Getting along with others	lot of problem	some difficulty	well	extremely well	not so important	important	more important	most important	
Identifying and solving problems	lot of problem	some difficulty	well	extremely well	not so important	important	more important	most important	

Occupational Self Assessment
Myself (continued)

Name: _____ Date: _____

Step 1: Below are statements about things you do in everyday life. For each statement, circle how well you do it. If an item does not apply to you, cross it out and move on to the next item.					Step 2: Next, for each statement, circle how important this is to you.				Step 3: Choose up to 4 things about yourself that you would like to change (You can also write comments in this space)
	I have a lot of problem doing this	I have some difficulty doing this	I do this well	I do this extremely well	This is not so important to me	This is important to me	This is more important to me	This is most important to me	I would like to change
Relaxing and enjoying myself	lot of problem	some difficulty	well	extremely well	not so important	important	more important	most important	
Getting done what I need to do	lot of problem	some difficulty	well	extremely well	not so important	important	more important	most important	
Having a satisfying routine	lot of problem	some difficulty	well	extremely well	not so important	important	more important	most important	
Handling my responsibilities	lot of problem	some difficulty	well	extremely well	not so important	important	more important	most important	
Being involved as a student, worker, volunteer, and/or family member	lot of problem	some difficulty	well	extremely well	not so important	important	more important	most important	
Doing activities I like	lot of problem	some difficulty	well	extremely well	not so important	important	more important	most important	
Working towards my goals	lot of problem	some difficulty	well	extremely well	not so important	important	more important	most important	
Making decisions based on what I think is important	lot of problem	some difficulty	well	extremely well	not so important	important	more important	most important	
Accomplishing what I set out to do	lot of problem	some difficulty	well	extremely well	not so important	important	more important	most important	
Effectively using my abilities	lot of problem	some difficulty	well	extremely well	not so important	important	more important	most important	

OSA Competence Key

	Rate Client Here	1		2		3		4
Concentrating on my tasks		1		2		3		4
Physically doing what I need to do		1		2		3		4
Taking care of the place where I live		1		2		3		4
Taking care of myself		1		2		3		4
Taking care of others for whom I am responsible		1		2		3		4
Getting where I need to go		1		2		3		4
Managing my finances		1		2		3		4
Managing my basic needs		1		2		3		4
Expressing myself to others		1		2		3		4
Getting along with others		1		2		3		4
Identifying and solving problems		1		2		3		4
Relaxing and enjoying myself		1		2		3		4
Getting done what I need to do		1		2		3		4
Having a satisfying routine		1		2		3		4
Handling my responsibilities		1		2		3		4
Being involved as a student, worker, volunteer, and/or family member		1		2		3		4
Doing activities I like		1		2		3		4
Working towards my goals		1		2		3		4
Making decisions based on what I think is important		1		2		3		4
Accomplishing what I set out to do		1		2		3		4
Effectively using my abilities		1		2		3		4

Measure client here. Circle ratings and draw line.

Total Score _____

Total Score	Measure	Error
0	-2	14
10	-8	8
20	-18	5
30	-28	3
40	-38	2
50	-48	3
60	-58	3
70	-68	3
80	-78	4
90	-88	5
100	-98	14

Client Measure _____

Standard Error _____

Total Score	Measure	Error
21	0	14
22	9	6
23	14	6
24	18	5
25	20	4
26	22	4
27	24	3
28	25	3
29	27	3
30	29	3
31	29	3
32	30	3
33	31	3
34	32	3
35	33	3
36	35	3
37	36	3
38	36	3
39	36	2
40	37	2
41	38	2
42	39	2
43	40	2
44	41	2
45	41	2
46	42	2
47	43	2
48	44	2
49	44	2
50	45	2
51	46	2
52	47	3
53	48	3
54	49	3
55	50	3
56	51	3
57	52	3
58	53	3
59	53	3
60	54	3
61	55	3
62	56	3
63	57	3
64	58	3
65	59	3
66	60	3
67	61	3
68	62	3
69	63	3
70	64	3
71	66	3
72	68	3
73	69	3
74	70	3
75	71	3
76	72	3
77	74	3
78	76	4
79	77	4
80	78	4
81	80	5
82	82	5
83	86	6
84	91	9
100	100	14

R 12-04

Penilaian Carakerja Sendiri
Diri Sendiri

Nama:_____ **Date:_____**

Langkah 1: Di bawah adalah kenyataan berkenaan perkara yang anda lakukan dalam kehidupan seharian. Setiap kenyataan, bulatkan berapa baik anda lakukan. Jika kenyataan tersebut tidak berkenaan, pangkah dan sila kepada kenyataan berikutnya.					**Langkah 2: Seterusnya, bagi setiap kenyataan di bawah, sila bulatkan yang paling penting bagi anda**				**Langkah 3: Pilih 4 perkara anda memerlukan perubahan (Anda boleh menulis komen pada ruang yang disediakan)**
	Saya mengalami banyak kesukaran melakukannya	**Saya mengalami sedikit kesukaran melakukannya**	**Saya melakukan dengan baik**	**Saya melakukannya dengan sangat baik**	**Ini kurang penting untuk saya**	**Ini penting untuk saya**	**Ini lebih penting untuk saya**	**Ini amat penting untuk saya**	**Saya ingin melakukan perubahan**
Memberi tumpuan kepada tugasan	**Banyak masalah**	**Sedikit kesukaran**	**Baik**	**Sangat baik**	**Kurang penting**	**Penting**	**Lebih penting**	**Amat penting**	
Melakukan aktiviti fizikal	**Banyak masalah**	**Sedikit kesukaran**	**Baik**	**Sangat baik**	**Kurang penting**	**Penting**	**Lebih penting**	**Amat penting**	
Menguruskan tempat tinggal sendiri	**Banyak masalah**	**Sedikit kesukaran**	**Baik**	**Sangat baik**	**Kurang penting**	**Penting**	**Lebih penting**	**Amat penting**	
Mengurus diri sendiri	**Banyak masalah**	**Sedikit kesukaran**	**Baik**	**Sangat baik**	**Kurang penting**	**Penting**	**Lebih penting**	**Amat penting**	
Boleh menguruskan tanggungan	**Banyak masalah**	**Sedikit kesukaran**	**Baik**	**Sangat baik**	**Kurang penting**	**Penting**	**Lebih penting**	**Amat penting**	
Boleh pergi ke tempat yang dikehendaki	**Banyak masalah**	**Sedikit kesukaran**	**Baik**	**Sangat baik**	**Kurang penting**	**Penting**	**Lebih penting**	**Amat penting**	
Menguruskan	**Banyak**	**Sedikit**	**Baik**	**Sangat baik**	**Kurang**	**Penting**	**Lebih**	**Amat**	

kewangan sendiri	**masalah**	**kesukaran**			**penting**		**penting**	**penting**	
Mengurus perkara asas untuk keperluan sediri(makanan, ubat-ubatan)	**Banyak masalah**	**Sedikit kesukaran**	**Baik**	**Sangat baik**	**Kurang penting**	**Penting**	**Lebih penting**	**Amat penting**	
Meluahkan perasaan diri sendiri kepada orang lain	**Banyak masalah**	**Sedikit kesukaran**	**Baik**	**Sangat baik**	**Kurang penting**	**Penting**	**Lebih penting**	**Amat penting**	
Boleh menjalinkan hubungan dengan orang lain	**Banyak masalah**	**Sedikit kesukaran**	**Baik**	**Sangat baik**	**Kurang penting**	**Penting**	**Lebih penting**	**Amat penting**	
Mengenal pasti dan menyelesaikan masalah	**Banyak masalah**	**Sedikit kesukaran**	**Baik**	**Sangat baik**	**Kurang penting**	**Penting**	**Lebih penting**	**Amat penting**	

Penilaian Carakerja Sendiri
Diri Sendiri (sambungan)

Nama:_____ **Date:**_____

Langkah 1: Di bawah adalah kenyataan berkenaan perkara yang anda lakukan dalam kehidupan seharian. Setiap kenyataan, bulatkan berapa baik anda lakukan. Jika kenyataan tersebut tidak berkenaan, pangkah dan sila kepada kenyataan berikutnya.					Langkah 2: Seterusnya, bagi setiap kenyataan di bawah, sila bulatkan yang paling penting bagi anda.				Langkah 3: : Pilih 4 perkara anda memerlukan perubahan (Anda boleh menulis komen pada ruang yang disediakan)
	Saya mengalami banyak masalah melakukannya	Saya mengalami sedikit kesukaran melakukannya	Saya melakukan dengan baik	Saya melakukannya dengan sangat baik	Ini kurang penting untuk saya	Ini penting untuk saya	Ini lebih penting untuk saya	Ini amat penting untuk saya	Saya ingin melakukan perubahan
Bertenang dan menggembirakan diri sendiri	Banyak masalah	Sedikit kesukaran	Baik	Sangat baik	Kurang penting	Penting	Lebih penting	Amat penting	
Menyelesaikan perkara yang sepatutnya saya buat	Banyak masalah	Sedikit kesukaran	Baik	Sangat baik	Kurang penting	Penting	Lebih penting	Amat penting	
Kepuasan terhadap rutin harian	Banyak masalah	Sedikit kesukaran	Baik	Sangat baik	Kurang penting	Penting	Lebih penting	Amat penting	
Menguruskan perkara yang berada di bawah tanggungjawab saya	Banyak masalah	Sedikit kesukaran	Baik	Sangat baik	Kurang penting	Penting	Lebih penting	Amat penting	
Boleh melibatkan diri	Banyak masalah	Sedikit kesukaran	Baik	Sangat baik	Kurang penting	Penting	Lebih penting	Amat penting	

samada sebagai pelajar, pekerja, sukarelawan, atau ahli keluarga									
Melakukan aktiviti yang digemari	**Banyak masalah**	**Sedikit kesukaran**	**Baik**	**Sangat baik**	**Kurang penting**	**Penting**	**Lebih penting**	**Amat penting**	
Berusaha kearah matlamat yang saya tetapkan	**Banyak masalah**	**Sedikit kesukaran**	**Baik**	**Sangat baik**	**Kurang penting**	**Penting**	**Lebih penting**	**Amat penting**	
Membuat keputusan berdasarkan apa yang saya fikir penting	**Banyak masalah**	**Sedikit kesukaran**	**Baik**	**Sangat baik**	**Kurang penting**	**Penting**	**Lebih penting**	**Amat penting**	
Melaksanakan apa yang telah dirancangkan terlebih dahulu	**Banyak masalah**	**Sedikit kesukaran**	**Baik**	**Sangat baik**	**Kurang penting**	**Penting**	**Lebih penting**	**Amat penting**	
Menggunakan keupayaan secara berkesan	**Banyak masalah**	**Sedikit kesukaran**	**Baik**	**Sangat baik**	**Kurang penting**	**Penting**	**Lebih penting**	**Amat penting**	

SF36 VERSION 2

OVERALL HEALTH

The following questions ask for your views about your health and how you feel about life in general. If you are unsure about how to answer any question, try and think about your overall health and give the best answer you can. Do not spend too much time answering, as your immediate response is likely to be the most accurate.

---

1. In general, would you say your health is:

(Please tick **one** box)

- Excellent ☐
- Very good ☐
- Good ☐
- Fair ☐
- Poor ☐

---

2. Compared to 3 months ago, how would you rate your health in general now?

(Please tick **one** box)

- Much better than 3 months ago ☐
- Somewhat better than 3 months ago ☐
- About the same ☐
- Somewhat worse now than 3 months ago ☐
- Much worse now than 3 months ago ☐

3. The following questions are about activities you might do during a typical day. Does your health limit you in these activities? If so, how much?

(Please tick **one** box on each line)	Yes, limited a lot	Yes, limited a little	No, not limited at all
a) **Vigorous activities,** such as running, lifting heavy objects, participating in strenuous sports	☐	☐	☐
b) **Moderate activities,** such as moving a table, pushing a vacuum, bowling or playing golf	☐	☐	☐
c) Lifting or carrying groceries	☐	☐	☐
d) Climbing **several** flights of stairs	☐	☐	☐
e) Climbing **one** flight of stairs	☐	☐	☐
f) Bending kneeling or stooping	☐	☐	☐
g) Walking **more than a mile**	☐	☐	☐
h) Walking **half a mile**	☐	☐	☐
i) Walking **100 yards**	☐	☐	☐
j) Bathing and dressing yourself	☐	☐	☐

---

4. During the past 2 weeks, how much time have you had any of the following problems with your work or other regular daily activities as a result of your physical health?

(Please tick **one** box) on each line	All of the time	Most of the time	Some of the time	A little of the time	None of the time
a) Cut down on the **amount of time** you spent on work or other activities	☐	☐	☐	☐	☐
b) **Accomplished less** than you would like	☐	☐	☐	☐	☐
c) Were limited in the **kind** of work or other activities	☐	☐	☐	☐	☐
d) Had difficulty performing the work or other activities (eg it took more effort)	☐	☐	☐	☐	☐

5. During the past 2 weeks, how much time have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)?

(Please tick **one** box) on each line	**All of the time**	**Most of the time**	**Some of the time**	**A little of the time**	**None of the time**
a) Cut down on the **amount of time** you spent on work or other activities	☐	☐	☐	☐	☐
b) **Accomplished less** than you would like	☐	☐	☐	☐	☐
c) Didn't do work or other activities as **carefully** as usual	☐	☐	☐	☐	☐

---

6. During the past 2 weeks, to what extent have your physical health or emotional problems interfered with your normal social activities with family, neighbours or groups?

(Please tick **one** box)

- Not at all ☐
- Slightly ☐
- Moderately ☐
- Quite a bit ☐
- Extremely ☐

---

7. How much bodily pain have you had during the past 2 weeks ?

(Please tick **one** box)

- None ☐
- Very mild ☐
- Mild ☐
- Moderate ☐
- Severe ☐
- Very Severe ☐

8. During the past 2 weeks, how much did pain interfere with your normal work (including bothoutside the home and housework)?

(Please tick **one** box)

- Not at all ☐
- Slightly ☐
- Moderately ☐
- Quite a bit ☐
- Extremely ☐

---

9. These questions are about how you feel and how things have been with you during the past 2 weeks. For each question please give one answer that comes closest to the way you have been feeling.

(Please tick **one** box on each line)

	How much time during the last 2 weeks:	**All of the time**	**Most of the time**	**A good bit of the time**	**Some of the time**	**A little of the time**	**None of the time**
a)	Did you feel full of life?	☐	☐	☐	☐	☐	☐
b)	Have you been a very nervous person?	☐	☐	☐	☐	☐	☐
c)	Have you felt so down in the dumps that nothing would cheer you up?	☐	☐	☐	☐	☐	☐
d)	Have you felt calm and peaceful?	☐	☐	☐	☐	☐	☐
e)	Did you have a lot of energy?	☐	☐	☐	☐	☐	☐
f)	Have you felt downhearted and low?	☐	☐	☐	☐	☐	☐
g)	Did you feel worn out?	☐	☐	☐	☐	☐	☐
h)	Have you been a happy person?	☐	☐	☐	☐	☐	☐
i)	Did you feel tired?	☐	☐	☐	☐	☐	☐

10. During the past 2 weeks, how much of the time has your physical health or emotional problems interefered with your social activities (like visiting friends, relatives etc.).

(Please tick **one** box)

- All of the time ☐
- Most of the time ☐
- Some of the time ☐
- A little of the time ☐
- None of the time ☐

---

11. How TRUE or FALSE is each of the following statements for you?

(Please tick **one** box on each line)

		Definitely true	Mostly true	Not sure	Mostly false	Definitely false
a)	I seem to get ill more easily than other people	☐	☐	☐	☐	☐
b)	I am as healthy as anybody I know	☐	☐	☐	☐	☐
c)	I expect my health to get worse	☐	☐	☐	☐	☐
d)	My health is excellent	☐	☐	☐	☐	☐

---

12. During the last 12 months, how many hours on average per day have you spent caring for the person suffering from Parkinson's disease?

_____ **Hours per day**

If you did not have to spend this time caring, what would you otherwise have done withthese hours? *(please tick all those relevant activities and the number of hours which would have been spent on each).*

For example, Paid employment	☑	*4 hours*
Paid employment	☐	___ hours
Leisure activities such as gardening/reading/relaxing	☐	___ hours
Other (e.g. shopping, housework)	☐	___ hours

If other, please specify _____

Completed by: ..... **Date completed:** ..... / ..... / .....

SF36 VERSION 2

TAHAP KESIHATAN

Soalan-soalan di bawah merupakan soalan tentang pandangan anda berkenaan kesihatan dan kehidupan anda secara umum. Sekiranya anda tidak pasti akan tahap kesihatan anda, cuba nilaikan tahap kesihatan anda sekarang dan berikan jawapan yang terbaik. Sekiranya anda pasti akan jawapan anda, sila jawab dengan pantas.

1. **Secara umumnya, apakah tahap kesihatan anda:**

(sila tandakan satu petak sahaja)

- Sangat baik ☐
- Baik ☐
- Agak baik ☐
- Sederhana ☐
- Teruk ☐

2. **Secara amnya, apakah tahap kesihatan anda berbanding 3 bulan yang lalu?**

(Sila tandakan satu petak sahaja)

- Lebih baik dari 3 bulan lalu ☐
- Agak baik berbanding 3 bulan lalu ☐
- Tiada perubahan ☐
- Agak teruk dari 3 bulan lalu ☐
- Lebih teruk berbanding 3 bulan lalu ☐

3. **Soalan-soalan berikut adalah mengenai aktiviti yang mungkin anda lakukan setiap hari. Adakah tahap kesihatan anda menghalang daripada melakukan aktiviti berikut?Jika ya, apakah tahapnya?**

(Sila tandakan **satu** petak sahaja)

	Terbatas	Sedikit terbatas	Tidak terbatas
a) **Aktiviti lasak** seperti berlari, mengangkat objek berat, menyertai sukan lasak.	☐	☐	☐
b) **Aktiviti sederhana** seperti mengangkat meja, memvakum,bermain boling atau golf.	☐	☐	☐
c) Mengangkat atau membawa beg barangan runcit.	☐	☐	☐
d) Menaiki **beberapa** anak tangga.	☐	☐	☐
e) Menaiki **satu** anak tangga.	☐	☐	☐
f) Melutut atau membongkok.	☐	☐	☐
g) Berjalan **melebihi sebatu** (1.6 km).	☐	☐	☐
h) Berjalan **setengah batu** (0.8 km).	☐	☐	☐
i) Berjalan sejauh **100 ela** (91 meter).	☐	☐	☐
j) Mandi dan bersiap	☐	☐	☐

4. **Sepanjang <u>2 minggu yang lalu</u>, adakah anda kerap mengalami keadaan berikut ketika melakukan kerja atau aktiviti seharian yang <u>menjejaskan kesihatan fizikal</u> anda?**

(Sila tanda di **satu** kotak sahaja) pada setiap ayat.

	Sangat Kerap	Kerap	Agak kerap	Jarang	Tiada
a) Mengurangkan **waktu** anda semasa melakukan kerja atau aktiviti lain.	☐	☐	☐	☐	☐
b) **Kurang sempurna** seperti yang anda mahu.	☐	☐	☐	☐	☐

c) Terhad kepada **jenis** kerja atau aktiviti.	☐	☐	☐	☐	☐
d) Sukar melakukan kerja atau aktiviti lain (contohnya, perlu lebih tenaga)	☐	☐	☐	☐	☐

---

5. Sepanjang <u>2 minggu yang lalu</u>, adakah anda kerap mengalami masalah ketika melakukan kerja atau aktiviti seharian <u>berikutan masalah emosi</u> yang dihadapi? (contohnya, murung atau bersedih)

(Sila tanda di **satu** kotak sahaja) pada setiap ayat.

	Terlalu Kerap	Agak Kerap	Tidak Kerap	Jarang	Tiada
a) Mengurangkan **waktu** anda semasa melakukan kerja atau aktiviti lain.	☐	☐	☐	☐	☐
b) **Kurang sempurna** seperti yang anda mahu.	☐	☐	☐	☐	☐
c) Kurang berhati-hati ketika melakukan kerja atau aktiviti **seperti selalu.**	☐	☐	☐	☐	☐

---

6. Sepanjang <u>2 minggu yang lalu</u>, sejauh manakah masalah kesihatan fizikal dan emosi anda menganggu perhubungan sosial bersama keluarga, jiran atau di dalam kumpulan?

(Sila tanda di **satu** kotak sahaja)

Tidak pernah	☐
Sedikit sahaja	☐
Sederhana	☐
Agak kerap	☐
Kerap	☐

---

7. **Apakah tahap kesakitan badan yang anda alami <u>sepanjang 2 minggu</u> yang lalu?**
(Sila tanda di **satu** kotak sahaja)

Tidak sakit	☐
Sangat ringan	☐
Ringan	☐
Sederhana	☐
Sakit	☐
Terlalu sakit	☐

---

8. **<u>Sepanjang 2 minggu</u>, sejauh manakah kesakitan yang anda alami menganggu kerja anda (termasuk di luar dan di dalam rumah)**

(Sila tanda di **satu** kotak sahaja)

Tidak pernah	☐
Sedikit sahaja	☐
Sederhana	☐
Agak kerap	☐
Kerap	☐

---

9. **Soalan-soalan berikut menerangkan perasaan anda dan apa yang anda alami <u>sepanjang 2 minggu</u> yang lalu. Sila berikan jawapan yang hampir tepat untuk mengambarkan perasaan anda.**

(Sila tanda di **satu** kotak sahaja)

Apakah kekerapan sepanjang:
<u>2 minggu yang lalu</u>

	Sepanjang masa	Selalu	Kekadang	Tidak selalu	Jarang	Tidak pernah
a) Adakah anda rasa puas dalam hidup?	☐	☐	☐	☐	☐	☐

b) Pernahkah anda berasa gemuruh?	☐	☐	☐	☐	☐	☐
c) Adakah anda pernah kecewa?	☐	☐	☐	☐	☐	☐
d) Adakah anda pernah berasa tenang dan aman?	☐	☐	☐	☐	☐	☐
e) Adakah anda bertenaga?	☐	☐	☐	☐	☐	☐
f) Adakah anda pernah bersedih dan merendah diri.	☐	☐	☐	☐	☐	☐
g) Adakah anda kelesuan?	☐	☐	☐	☐	☐	☐
f) Adakah anda periang?	☐	☐	☐	☐	☐	☐
h) Adakah anda kepenatan?	☐	☐	☐	☐	☐	☐

10. **<u>Sepanjang 2 minggu,</u> sejauh manakah <u>kesihatan fizikal atau masalah emosi</u> anda menganggu aktiviti sosial anda (seperti melawat rakan dan saudara)**

(Sila tanda di **satu** kotak sahaja)

- Sepanjang masa ☐
- Selalu ☐
- Kekadang ☐
- Jarang ☐
- Tidak pernah ☐

11. Adakah BENAR atau SALAH bagi pernyataan berikut kepada anda?

(Sila tanda di **satu** kotak sahaja)

	Amat Tepat	Tepat	Tidak pasti	Salah	Tidak benar sama sekali
a) Saya mudah dijangkiti penyakit berbanding orang lain.	☐	☐	☐	☐	☐
b) Kesihatan saya sama seperti orang lain.	☐	☐	☐	☐	☐
c) Saya rasa kesihatan saya semakin teruk.	☐	☐	☐	☐	☐
d) Kesihatan saya di tahap yang terbaik.	☐	☐	☐	☐	☐

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12. Sepanjang 12 bulan yang lalu, berapakah purata jam sehari anda melawat pesakit Parkinson?

_____ Jam sehari

Sekiranya anda tidak melawat pesakit ini, apakah yang anda lakukan pada waktu tersebut?*(sila tandakan aktiviti yang relevan dan jumlah jam yang telah dihabiskan).*

Sebagai contohnya, pekerjaan berbayar	√	*4* Jam
Pekerjaan berbayar	☐	_____Jam
Aktiviti riadah seperti berkebun, membaca	☐	_____Jam
Lain-lain (membeli belah…)	☐	_____Jam

Jika lain-lain, sila nyatakan _____

Dilengkapkan oleh: ..... **Tarikh :** ..... / ..... / .....

DASS21

Name: *Date:*

Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you *over the past week*. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

0 Did not apply to me at all
1 Applied to me to some degree, or some of the time
2 Applied to me to a considerable degree, or a good part of time
3 Applied to me very much, or most of the time

1	I found it hard to wind down	0	1	2	3
2	I was aware of dryness of my mouth	0	1	2	3
3	I couldn't seem to experience any positive feeling at all	0	1	2	3
4	I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5	I found it difficult to work up the initiative to do things	0	1	2	3
6	I tended to over-react to situations	0	1	2	3
7	I experienced trembling (eg, in the hands)	0	1	2	3
8	I felt that I was using a lot of nervous energy	0	1	2	3
9	I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
10	I felt that I had nothing to look forward to	0	1	2	3
11	I found myself getting agitated	0	1	2	3
12	I found it difficult to relax	0	1	2	3
13	I felt down-hearted and blue	0	1	2	3
14	I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3
15	I felt I was close to panic	0	1	2	3
16	I was unable to become enthusiastic about anything	0	1	2	3
17	I felt I wasn't worth much as a person	0	1	2	3
18	I felt that I was rather touchy	0	1	2	3
19	I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat)	0	1	2	3
20	I felt scared without any good reason	0	1	2	3
21	I felt that life was meaningless	0	1	2	3

DASS21

Nama: *Tarikh:*

Sila baca setiap kenyataan di bawah dan bulatkan pada nombor 0,1,2 atau 3 bagi menggambarkan keadaan anda sepanjang minggu yang lalu. Tiada jawapan yang betul atau salah. Jangan mengambil masa yang terlalu lama untuk menjawab mana-mana kenyataan.

Skala pemarkahan adalah seperti berikut:

0 **Tidak langsung** menggambarkan keadaan saya
1 **Sedikit atau jarang-jarang** menggambarkan keadaan saya.
2 **Banyak atau kerapkali** menggambarkan keadaan saya.
3 **Sangat banyak atau sangat kerap** menggambarkan keadaan saya

1	Saya dapati diri saya sukar ditenteramkan	0	1	2	3
2	Saya sedar mulut saya terasa kering	0	1	2	3
3	Saya tidak dapat mengalami perasaan positif sama sekali	0	1	2	3
4	Saya mengalami kesukaran bernafas (contohnya pernafasan yang laju, tercungap-cungap walaupun tidak melakukan senaman fizikal)	0	1	2	3
5	Saya sukar untuk mendapatkan semangat bagi melakukan sesuatu perkara	0	1	2	3
6	Saya cenderung untuk bertindak keterlaluan dalam sesuatu keadaan	0	1	2	3
7	Saya rasa menggeletar (contohnya pada tangan)	0	1	2	3
8	Saya rasa saya menggunakan banyak tenaga dalam keadaan cemas	0	1	2	3
9	Saya bimbang keadaan di mana saya mungkin menjadi panik dan melakukan perkara yang membodohkan diri sendiri	0	1	2	3
10	Saya rasa saya tidak mempunyai apa-apa untuk diharapkan	0	1	2	3
11	Saya dapati diri saya semakin gelisah	0	1	2	3
12	Saya rasa sukar untuk relaks	0	1	2	3
13	Saya rasa sedih dan murung	0	1	2	3
14	Saya tidak dapat menahan sabar dengan perkara yang menghalang saya meneruskan apa yang saya lakukan	0	1	2	3
15	Saya rasa hampir-hampir menjadi panik/cemas	0	1	2	3
16	Saya tidak bersemangat dengan apa jua yang saya lakukan.	0	1	2	3
17	Saya tidak begitu berharga sebagai seorang individu	0	1	2	3
18	Saya rasa yang saya mudah tersentuh	0	1	2	3
19	Saya sedar tindakbalas jantung saya walaupun tidak melakukan aktiviti fizikal (contohnya kadar denyutan jantung bertambah, atau denyutan jantung berkurangan)	0	1	2	3
20	Saya berasa takut tanpa sebab yang munasabah	0	1	2	3
21	Saya rasa hidup ini tidak bermakna	0	1	2	3

MONASH University

Medicine, Nursing and Health Sciences

Project Title: **Perception of injured workers with musculoskeletal disorders regarding occupational, physical and mental functioning**

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1. **What type of treatment or rehabilitation did you obtain from SOCSO? [please tick]**
   - I. Medical treatment (e.g. analgesic pain, surgery, etc) [ ]
   - II. Physiotherapy [ ]
   - III. Occupational Therapy [ ]
   - IV. Acupuncture [ ]
   - V. Chiropractor [ ]
   - VI. Reflexology [ ]
   - VII. Massage [ ]
   - VIII. Other:_____(please explain) [ ]

2. **What is your gender? [please tick]**
   - I. Female [ ]
   - II. Male [ ]

3. **Thick your age group ?**
   18 to 25 [ ]
   26 to 35 [ ]
   36 to 45 [ ]
   46 to 55 [ ]

4. **What is your height?**
   [_____m]

5. **What is your weight?**
   [_____kg]

6. What is your ethnic background? [please tick]

1. Malay [ ]
2. Chinese [ ]
3. Indian [ ]
4. Others:_____(please explain) [ ]

7. Type of job? [please tick]

I. Office work [ ]
II. Labour work [ ]
III. Technical work [ ]
IV. General work [ ]
V. Others, Please specify:_____

8. Type of employer? [please tick]

I. Small size company (less than 20 workers) [ ]
II. Medium size company (21-50 workers) [ ]
III. Big size company (More than 50 workers) [ ]
IV. Others (please specify _____)

9. How long you been away from work due to your condition?

[_____days]

10. How long you had you been working before suffering Musculoskeletal Disorders?

[_____months]

11. The statement in each phases below describe what phase that you are currently attending in Return to Work (RTW) programme conducted by Social Security Organization (SOCSO)? Please choose only one phase that describes you, [please tick]

Phase 1 [ ]

You are off work due to your back and neck condition. You are at no time during this phase back at work, either in pre-injury or alternative capacity, still under medication and rehabilitation. At this phase, you being assess for functional abilities, employment seeking behaviors and motivation

Phase 2 [ ]

You are just commencing your work, you been given a modified task, time off, or job which has different requirements to reduce your pain. At this phase while you working, you experienced recurrence disabilities for example pain , restricted activity , physical and mental functioning limitations etc, taking time or day off then continuing working again.

Phase 3 [ ]

You are continuing working at your previous capacity ability. You are able to perform duties satisfactorily. You are able to achieve goal productivity levels over the long term, and demonstrate potential for advancement.

Phase 4 [ ]

You are able to improve your worker's responsibility and increase remuneration levels. You are able further your career development. You been chosen for to continue your education programs and pursuing your short and long-term career

12. What is the location of your injuries? [please tick all that apply]

I. Head [ ]
II. Neck [ ]
III. Back [ ]
IV. Upper Limb [ ]
V. Lower Limb [ ]
VI. Others:_____(please explain) [ ]

13. Visual Analogue Scale

Directions: Please mark on the line where the pain is in relation to the two extremes.

No pain **Worst pain imaginable**

14. Physical work load.

Directions: Please mark on the line your physical work load **before** the injury.

Not strenuous at all **very strenuous**

Directions: Please mark on the line your physical work load **after** the injury.

Not strenuous at all **very strenuous**

15. Psychological work load.

Directions: Please mark on the line your psychological work load **before** the injury.

Not stressful at all **very stressful**

Directions: Please mark on the line your psychological work load **after** the injury.

Not stressful at all **very stressful**

MONASH University

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1. Topic: **Compensation status in terms of insurance benefits and compensation for time off work**
   Explain to me what type of compensation you have been given by the SOCSO. (Prompt: Is it enough to cover your injuries? Is it what you expected? What other type of compensation do you recommend?)
   Tell me about the time off that you were given after your injuries. (Prompt: How much was it? Did it help your recovery? Who gave permission? Who helped you?)

2. Topic: **Return to work goal**
   - Tell me about your RTW goals. (Prompts – What were they, who developed them, what involvement did you have, have your goals been achieved? How? Were they what you expected, felt that it addressed your specific issues?)

3. Topic: **Motivation**

   In what ways do you think that your condition affected your motivation to engage in the RTW programmme (prompts: What helped you to be more motivated to do your work tasks, daily activities, and leisure activities)

4. Topic: **Expectation**
   - Can you tell me more what the RTW services in which you have been involved? (What were they? In what ways do they help/not help you? Is this what you had expected? How?)

5. Topic: **Job seeking/modification**
   - Can you explain how you managed the tasks given to you during the returning work? (Prompts: What were they, who helped you, what strategies were used, what supports did you have support from your employer? Who was supporting you, did the supports benefit/not benefit you, any recommendations that you think can improve your situation?)

6. Topic: **Work maintenance**
   - Tell me about your current performance after the injuries. (Prompts: What are the tasks that are difficult for you to maintain. What supports do you have? Who's helping you? Do you feel confident that recurrent injuries will not happen again when you return to your previous work? Why?)

7. Topic: **Career advancement.**
   - Have you been given more demanding tasks after you recovered from injuries? (Prompts: What tasks have you been given and how are they different from before the RTW program. Can you manage the tasks? Has this resulted in an increased salary/promotion? How do you perceive yourself in relation to your career development after recovering from your injury?)
   - Have you been given opportunity to be promoted or given more responsibilities? (Prompts: What are your opportunities or responsibilities? Are you satisfied with it?)

8. Topic: **Adherence on the policy or guideline, appropriates of the management or care**
   - What sorts of supports have been available from your employer/organization? Were there other supports that you would have liked – explain further? If someone you knew had an injury like yours, what would you recommend that they do to make sure that they received the right sort of support from the employer/organization?

9. Topic: **Reintegration in relation to acceptance by others**
   Describe any supports from other people that you had during your injury phase. (Prompts: Who was affected by your injury e.g. family members? What things were affected e.g. helping out at home? How did you manage?

10. Topic: **Interaction with stakeholders**.
    - Tell me during your injuries what agencies/parties gave you support. (Prompt: Who are they? What type of support was given? What other supports do you think you needed?

11. Are there any questions that you think I should have asked/that I have missed?

12. Are there any questions you would like to ask me?