

THE IMPACT OF RETURN TO WORK PROGRAMS ON THE HEALTH STATUS OF INJURED WORKERS WITH WORK-RELATED MUSCULOSKELETAL DISORDERS: A MALAYSIAN STUDY

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Abstract

Introduction:

This study explores the health status of injured workers in return to work (RTW) programs based on their ability and capacity. Injured workers were diagnosed with work-related musculoskeletal disorders. The findings will help not only the service provider plan a specific strategy but also allow stakeholders to review their role in the RTW program.

Methods:

102 participants were chosen from a national RTW program, and categorized into three groups based on different phases of the RTW program: off-work (n=30, 29.4%), work re-entry (n=44, 43.1%) and maintenance (n=28, 27.5%). Self-report questionnaires identified demographic data, health surveillance via SF-36 and perceived physical and psychological workload by 10-point numerical scales. Analysis of variance (ANOVA) and Kruskal-Wallis Test was employed to examine the differences in three phases of the RTW program. Paired *t*-test analyzed the differences of related samples of physical and psychological workload before and after injuries.

Results: The domains of health status are below the average compared to the norm-based population. Mental health component summary is better than physical health. At the domain level, there are significant differences among injured workers, specifically in the three RTW program phases. The SF-36 domains are: role-physical, vitality, bodily-pain, general health, and mental health ($p \leq 0.049$). In contrast, non-significant differences were found in physical and social functioning, and role of emotion status. Moreover, their self-perceived physical and psychological work-load significantly worsened after injuries ($p \leq 0.020$).

Conclusions: The case manager-coordinated RTW program provided further opportunities to improve injured workers' health status when looking at their differences for different phases of RTW. Other health professionals like occupational therapists, ergonomists and psychologists should become involved in the RTW program. Specific guidelines and regulations have to be implemented to ensure full participation with all parties in the workplace.

Keywords: Health status, return to work, phases and musculoskeletal disorders

Introduction

Work-related musculoskeletal disorders (MSDs) may develop over time or as the result of acute injuries, and are caused either by the work itself or the immediate environment [1-4]. Typically, MSDs affect people's back, neck, shoulders and upper limbs, with lower limbs less often affected [5]. People with MSDs often experience a number of complications associated with their injury, for example pain, stress, anxiety and depression. A number of previous studies found that pain is one of the major impairments of MSDs [1, 6, 7]. Psychological symptoms such as anxiety, stress and depression also commonly affect workers who are absent from work for long periods [1, 6, 8, 9]. Furthermore, people who suffer work-related MSDs may experience physical restrictions in daily life activities which could further compromise their

quality of life [1, 10-12]. Environmental barriers (e.g., poor workplace social culture or lack of family and workplace support) also increase considerably the stress and lower back pain experienced by the MSDs affected workers [13]. In addition, research has found that the workers who were absent from work for long periods experienced poor self-image or morale, changed life rhythms, as well as difficulties in carrying out daily life roles while attempting to return to work [13, 14]. Fear of rejection, anger, and isolation due to the inability to perform daily life duties and activities were also common psychological issues reported by injured workers [15].

Health status has been recently become a main concern in outcome measures for people with

MSDs. According to the World Health Organization (2006), health is defined as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” [16]. People with MSDs have significant variations in the extent and the nature of impairments and functional limitations, 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.

Return to work (RTW) programs involving a multi-disciplinary approach have been largely developed

The Malaysian context

The RTW program was introduced by the Social Security Organizations (SOCSO) in Malaysia for injured 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 the protection scheme if they are injured or disabled in the course of their employment, including workplace or commuting accidents and occupational diseases. In early 2008, SOCSO adopted the bio-psychosocial RTW program model developed in several countries such as Australia, Canada, Sweden and the United States. The main objectives of the SOCSO RTW program are to improve quality of life, retain skilled workers in the workplace, and reduce compensation claim costs [20]. In 2009, SOCSO spent almost USD\$219 million on temporary and permanent disablement benefits and invalidity pensions for injured workers. This cost increased considerably from USD\$187 million in 2008 [20]. According to the SOCSO report, the number of workers who have had more than 100 days sick leave was 51,107 cases between 1996 and 2009 [21], 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 area [21]. This scenario emphasizes why the establishment of a RTW program was necessary in Malaysia. The aim of the RTW program is to return injured workers to work safely and as soon as possible following

Aims and Objectives

Given that multi-disciplinary approaches led and coordinated by case managers have been shown to improve work disabilities as well as health status of injured workers [10, 12, 22], this study aimed to investigate health status of injured Malaysian

to assist in re-gaining working capacities and, importantly, health, quality of life or daily life roles in injured workers with work-related MSDs. The rehabilitation process is often long, depending not only on the provided services but also the support from stakeholders, including the employer, peers, family members and the wider community [17, 18]. The number of health professionals involved in the 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 [11, 12, 17-19].

rehabilitation, thus preventing further SOCSO cost blow-outs. However, the RTW program only began in early 2008 and its impact on health status of injured workers has not yet been explored.

Evaluations of RTW programs 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 services providers costs) and success rates for truly returning to work [11, 12, 17-19]. Most of these RTW outcomes were measured at 1, 2 or 5 years after those participants returned to work [10, 12, 22]. These studies mostly focused on injured workers at two key stages: the off-work phase or the return to work phase. None of the studies investigated the outcomes across the four different RTW program phases (Off-work, Work re-entry, Maintenance, and Advancement) described by Young et al. in 2005 [23]. It is important to provide empirical evidence for effective intervention based on the different 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.

workers with MSDs at different RTW program phases based on their abilities and capacities.

Specific objectives of this study were:

1. to identify the health status of workers with MSDs who are participating in Malaysian national RTW program;
2. to compare their health status by dividing them into different RTW phases; and
3. to compare the differences in their perceived physical and psychological workload before and after their injuries

Methods

Subjects and procedures

A randomized stratified sampling strategy, based on body part injured, 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 MSD; (2) ability to read and understand the Malaysian Language; and (3) involvement in the SOCSO RTW program between early 2008 and the end of 2010.

Four hundred potential participants were identified using a randomized computer sequence from SOSCO's database which includes records for a total of 997 injured workers. These identified participants received an official letter providing participation information sheets and a stamped envelope that can be used to return their written consent for participation. A total of 105 participants agreed to take part in the study as indicated by their consent form. They then received the SF-36 questionnaire [24] 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 (by using the criteria described by Young et al. 2005) into one of the four phases (off-work, re-entry, maintenance, and advancement). As described by Young et al. 2005 the injured workers may move between phases in a non-linear fashion. Some of the injured worker probably has experienced one or more phases of RTW phases, or due to recurrent injuries they returned back to off-work phase, in this study, they only have to choose only one phase that best describe their RTW status recently. These criteria were:

Phase *Off-work*:

You are off work due to your MSDs injuries. You are at no time during this phase back at work, either in pre-injury or in an alternative capacity, and 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.

Phase *Re-entry*:

You are just commencing your work. You have been given a modified task, time off, or a job which has different requirements to reduce your pain. While you are working, you may experience recurrent symptoms or disabilities (for example pain, restricted activity, physical and mental functioning limitations) which may have caused you to take time off from normal working hours.

Phase *Maintenance*:

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

Phase *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.

In addition, the participants were asked to rate their perceived physical and psychological workload; when they re-entering to their actual employment (return to work), before and after injuries, using a 10-point numerical scale, with 0 as not strenuous at all and 10 as very strenuous. Once completed, participants were required to return all survey forms and questionnaires by post. Telephone reminders were given at 14 days after the forms and questionnaires were sent

Instruments

The SF-36 is a self-report questionnaire to measure the overall health status 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 8 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) [24]. For each item, variations of 3 to 6 point scale are used and a sum score can be calculated for each domain. In addition, the physical component summary

comprised physical functioning, role-physical, bodily-pain and general health domains. The mental component summary comprised vitality, social functioning, role-emotional and mental-

health domains. The SF-36 has been culturally adapted and translated to the Malaysian language, and its validity and reliability were reported [25].

Ethics

Ethical approval was obtained from the Monash University Human Research Ethics Committee as

well as the SOCSO prior to the study being conducted.

Statistical analysis

The analysis of this study began with descriptive analysis of the SF-36 in all participants and the separate groups by different RTW phases. A two sided p value <0.05 was considered statistically significant for the groups' differences using one-way analysis of variances (ANOVA). The Shapiro-Wilk Test was used to test the normal distribution of the SF-36 scores [26]. One-way ANOVA and Kruskal-Wallis Test (depending whether the scores were normally distributed) were used to examine

the difference of the SF-36 scores (at both the sub-scale and component level) among the injured workers at different RTW phases [27]. The Levene statistics prior to the ANOVA, was used to examine the homogeneity of the SF-36 scores [27]. In addition, a paired t-test was employed to analyse the differences regarding the participants' physical and psychological workload before and after injuries [27]. All statistical analyses were performed using the Statistical Package for Social Sciences, Version 18 (SPSS, SPSS Inc, Chicago, IL) software.

Results

A total of 105 injured workers participated in this study, and the numbers in 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 of this study due to low statistical power. The limited size of this group was expected given that the SOCSO RTW program had been established only recently [21].

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 factory workers (28.4%). In addition, there were non-significant differences ($p = 0.107$) in the number of injured workers among the three RTW program phases (i.e. off-work, work re-entry and maintenance). However, significant differences were found in relation to gender, age, ethnicity, location of injury, types of work, and types of employer ($p < 0.001$). In addition, by using one-sample t-test there was a statistically significant difference in sick leave days (mean = 207.3 ± 208.2 , $p < 0.001$) in the total of participating workers. Their working days before the injuries was also significantly different (mean = $3,170.2 \pm 3,122.1$, $p < 0.001$).

The characteristics of the participants included in this study are reported in Table 1. Overall, male participants with a Malay ethnicity were the dominant group and the majorities were aged 26-35 years. The most common location of injury was in the lower limb (31.4%). Physiotherapy (44.1%) was the main rehabilitation

Table 1. Characteristics of participants at different phases in the study

Characters	Total (n=102)	Phase 1 <i>Off-work</i> (n=30)	Phase 2 <i>Re-entry</i> (n=44)	Phase 3 <i>Maintenance</i> (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)
None of the above	14 (13.7)	4 (13.3)	3 (6.8)	7 (25.0)
Type of occupation, n (%)				
Office work	15 (14.7)	3 (10.0)	10 (22.7)	2 (7.1)
Labor 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 than the above (Lorry driver and dispatch riders)	32 (31.4)	11 (36.7)	14 (31.8)	7 (25.0)
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 (more than 50 workers)	45 (44.1)	11(36.7)	21(47.7)	13 (46.4)
Other than above	8 (7.8)	6 (20.0)	1 (2.3)	1 (3.6)

Sick leave, days (mean ±SD) 207.2±208.2 327.89±286.88 163.0±139.7 152.2±151.1

Overview of the SF-36 sub-scales and physical/mental components summary in all participants

Table 2 shows the overall mean scores of the SF-36 sub-scales and physical and mental component summary. All mean scores of the SF-36 sub-scales and physical and mental components summary were found to be significantly lower than the average score of the norm-based scoring ($p < 0.001$) [28]. The highest mean scores (i.e., better functions)

for this sample were in the vitality (VT) sub-scale. The mental health component summary mean scores were also 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 overall mean scores of 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 of emotion (RE) and mental health (MH).

Table 2. Overall mean scores of the subscales and physical and mental components summary of the SF-36

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) [28]

Comparison of mean scores on the SF-36 sub-scales and physical and mental components summary across the three 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 statistic 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 results in the three phases of RTW program. The results of the ANOVA found that four sub-scales (RP, BP, GH and VT) of the SF-36 exhibited

significant differences between the groups based on the phase of the RTW program. There were no significant differences between the other sub-scales (physical functioning). Furthermore, their physical and mental summary scores were found to have no significant variations among the different phases of the RTW program.

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. There were no significant differences between the other 2 sub-scales (SF and RE). Details of the results of the ANOVA and Kruskal-Wallis tests are summarized in Table 3.

Perceived physical and psychological workloads before and after the injuries

In terms of perceived physical and psychological work-load we found that, in the overall sample, there were significant differences between the

participants' ratings of their workloads (both physical and psychological) before and after injury. Similar results with the injured workers in the Phase *Off-work* was found (this is likely to reflect those workers who attempted work *Re-entry* but this was not successful, and they moved back to the *Off-work* phase). However, only psychological

workload demonstrated significant increases post-injury with the participants in the *Re-entry* and *Maintenance* phases. Details of the results are shown in Table 4.

Discussion

This study, using a sample of Malaysian workers with MSDs, is the first to investigate the differences in injured workers' health status across Young's different phases (off-work, work re-entry and maintenance). We found that all the SF-36 subscales and physical/mental summary components of the injured workers attending the SOCSO RTW program were below average compared to the internationally-established normative population. Their physical component summary was also found to be lower than mental component summary. Moreover, by dividing them based on different phases of the SOCSO's RTW program, the five sub-scales of health status, i.e. role-physical (RP), bodily-pain (BP), general health (GH), vitality (VT) and mental health (MH), exhibited significant differences between groups. This indicates that the health status of the injured workers in some areas may improve as they regain considerable capacity and ability while progressing to higher phases in RTW program.

The MH, RP, BP, GH and VT statuses were improved significantly, probably because the workers recovered from their injuries or they were given light duties to reduce physical demands when they returned to work. This may also be the result of therapy received (such as Physiotherapy) as this treatment primarily focuses on improving injured workers' pain and physical abilities. It was thus expected that any significant changes would be similar to those reported in another previous study [29], where physical training that included aerobic capacity, muscle strength and endurance supervised by physiotherapists had a positive effect on physiological outcomes and functional status of job demand [29].

The most significant gains were in the mental health (MH) status scores as participants returned to work and carried on with their usual duties. This may be the result of the support and services provided or funded by SOCSO and reduced financial concerns during sick leave due to the payment of temporary disablement benefits. Injured workers may also have received additional support from family, relatives, peers and employers when they re-entered to workplace or maintained their work. Previous studies found that sick leave without financial and family, peer and employer support caused more stress, depression and anxiety among injured workers [13, 30]. Therefore, mental health support can be considered as a potential benefit of RTW programs conducted by Malaysian's SOCSO.

Physical functioning (PF) did not show significant improvement across the three phases of the RTW program included in this study. This may be explained by the fact that many participants had disabilities in lower limb (31.4%) and trunk (24.5%), and previous studies have shown that people who suffered injuries in these regions experienced a greater impact on their PF with a higher probability of permanent disability [31-34]. Moreover, in the current study they reported that their PF was greatly affected, especially in the items requiring a high degree of mobility or manual handling. 71.3% reported many limitations with vigorous and moderate activity and walking more than half a mile. 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 (100 yards). The majority of participants worked as factory workers, lorry or taxi drivers and dispatch riders, and therefore they would experience more impact on their day-to-day functioning, especially as their jobs involved greater physical demands and multi-tasking, resulting in little or slow improvement in their PF.

In this study, we found that participants' ratings of their physical and psychological workload increased significantly after the injuries. Moreover, injured workers at Phase *Off-work* faced similar experienced with their physical and psychological workload. In contrast, only psychological workload increased significantly with injured workers once progressing to Phase *Re-entry* and Phase *Maintenance*. One explanation for this may be that workplace tasks or equipment were not modified or changed so that their PF level was still viable. Such changes would be expected if health professionals, such as occupational therapists or ergonomists, were involved in providing such environmental adaptation of changes. Other published studies demonstrated that such professional involvement in the RTW program reduced the recurrence of injuries and restored injured workers' functional capacity and ability; therefore, this may help improve PF for injured workers [10, 35, 36].

Non-significant changes were reported for the social functioning (SF) of injured workers when they returned to work or achieved a maintenance standard. This may be explained by having only limited time as they progressed due to the demands of their workplace necessitating more responsibilities. Moreover, in this study we found that their psychological workload increased significantly after their injuries or while they were in different phases of RTW program. Perhaps, it could be also related to isolation or withdrawal as the result of their limited physical functioning. Therefore, improvement of their SF statuses needs to be taken into account further in the different

phases of RTW program.

Non-significant changes also occurred regarding the role of emotion (RE) sub-scale. Emotional problems, such as depression or anxiety, must be taken into account because it affects overall wellbeing of participants, either as workers or family members. Our results (i.e., about one third of the injured workers from current total population (N=102) reported lower scores in two RE items) further confirmed that they may be facing emotional problems while re-entering to their workplace. It was likely that the time they had for doing their regular daily activities was reduced and that 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 [15, 37].

Some global political and cultural issues could provide additional plausible reasons for non-significant changes of the PF, SF and RE sub-scales. For example, the employer may be involved only in a limited way and provided the worker with minor modification or adaptation of their workplace or duties based on a worker's capacity and ability. The support for this argument is based on the fact that, although Malaysia has several statutory Acts such as the Employees' Social Security Act 1969, Occupational Safety and Health Act 1984 and Disability Act 2008, there are no guidelines and regulations that specifically focus on occupational rehabilitation management (management of the return to work). This contrasts with countries such as Australia, which has clear guidelines such as the Victorian WorkCover Authority's WorkSafe program which, in conjunction with The Accident Compensation Act (1985), has been developed to regulate employers and health providers in dealing with injured workers with RTW issues. These 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 [11, 38, 39]. 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 [14]. 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 [1, 6-9, 15]. 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 [10, 40].

The present study had several limitations. First, the generalizability of the current study was limited since only a small proportion (10.5%) of the participants were recruited from the entire population attending the SOCSO RTW program. Second, this study was conducted in Malaysia and the results can only be applied in this cultural and economic context. More research involving cross-cultural comparisons should be done in the future. Third, 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. Finally, the SF-36 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.

Conclusion

Overall, the findings of this study indicate that SOCSO's RTW program may provide further opportunities for improving the health status of injured workers across different phases of the RTW program (off-work, work re-entry, and maintenance). Greater attention is needed with injured workers who have different capacities and abilities, especially in relation to physical emotional and social functioning. 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 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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Table 3. The differences in scores on the sub-scales of the SF-36 between the group of injured workers in Phase *Off-work*, Phase *Re-entry* and Phase *Maintenance*

SF-36 Subscale/ Component summary	Phase <i>Off-work</i>		Phase <i>Re-entry</i>		Phase <i>Maintenance</i>		Test statistic	p-value
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)		
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 performed by Kruskal-Wallis

Table 4. Differences between participants' ratings of physical and psychological workloads before and after injuries.

	Before injury		After injury		Paired differences Mean (SD)	CI	p-value
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)			
Total participants (n=102)							
Physical work load	4.78 (3.08)	5.81 (2.67)	-1.03 (4.27)	-1.90-0.16	0.020		
Psychological workload	3.98 (3.08)	6.37 (2.45)	-2.40 (3.43)	-3.10-(-1.69)	<0.001		
Phase Off-work (n=25)							
Physical work load	3.94 (3.26)	6.42 (3.22)	-2.48 (5.08)	-4.58-(0.38)	0.022		
Psychological workload	2.86 (2.95)	7.74 (2.20)	-4.88 (3.49)	-6.39-(-3.37)	<0.001		
Phase Re-entry (n=42)							
Physical work load	5.11 (3.05)	5.68 (2.52)	-0.57 (4.00)	-1.82-(0.67)	0.358		
Psychological workload	4.45 (2.82)	6.17 (2.42)	-1.71 (3.09)	-2.68-(-0.75)	0.001		
Phase Maintenance (n=28)							
Physical work load	5.03 (2.92)	5.46 (2.34)	-0.44 (3.68)	-1.86-(0.99)	0.537		
Psychological workload	4.17 (2.59)	5.56 (2.30)	-1.39 (2.91)	-2.52-(-0.27)	0.018		

Note: CI= Confidence Interval