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ASSESSING BODY POSTURE AND SKELETON -MUSCULAR DISORDERS AND RELATED FACTORS IN WORKERS OF GREENHOUSE IN KHOMEINISHAHR CITY

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Abstract

Introduction& Purpose

Nowadays inappropriate body posture at work is considered one of the most important risk factors of skeleton -muscular disorders¸as though many organic methods for improvement of work conditions and prevention of skeleton -muscular disturbances are egual to improvement of body posture at work. Skeleton -muscular disorders related to work are considered as one of the most common business disturbances and injuries. Among businesses in which these disorders are so common can be referred to farmers and workers of greenhouses.so symptoms are depending upon age, working history, work stations, exposure time and reguired force of work.

So, this study was implemented with the objective of assessing body posture and skeleton -muscular disorders and Related Factors in workers of greenhouse in khomeinishahr city.

Methods:

This is a descriptive-analytic investigation was done on 150 workers of greenhouses which have been chosen in simple approach¸ at different work stations. Body postures of the workers were assessed using demographic guestionnaire and software WinOwas¸and statistical analysis of data was implemented by using software spss¸ statistical test x2 ¸and variance analysis.values p<0/05 were considered as meaningful.

Results

The results from this study illustrated that among150 workers of greenhouse 47.4% had inappropriate body posture.and among 1800 assessed postures, 56% had back disorders and 44 had feet disorrder at risk of being hurt¸and 57% of postures watched at greenhouse work stations were placed among priorities for improvement actions 2,3 and 4 causing stress, harmful, and much harmful . In addition, there were a meaningful statistical relation

between body posture and age record of working, average working hours of a day, education, and work station. *(*p<0/05*)*

Conclusion

Based on the results of this research*,* the prevalence of skeleton- muscular disorders at greenhouse work stations has been in organs of back and feet *,* and among different work stations *,* body posture was unsuitable at filling flower-pot and weeding out stations (back was bended and feet were on one or bothe knees). So, in plans of applying ergonomy approaches to cure the disorders at work, priority is to take improvement action at these stations.

Key words: body posture, skeleton -muscular disorders, workers of greenhouse ,work station.

Introduction

Nowadays poor condition of body in work is the most important risk factors for musculoskeletal disorders, so that most of ergonomic solutions for improving working conditions and the prevention of musculoskeletal disorders, improve the body during work. [1] Work-related musculoskeletal disorders are the most common occupational diseases and injuries are considered. [2]

NIOSH (National Investigations Centre for Occupational Safety and Health) has classified diseases and complications from work on the basis of national importance (in terms of prevalence, severity and possible prevention) where skeletal disorders - muscle after respiratory diseases ranked second. [3]

Including jobs that musculoskeletal disorders are very common in ornamental flower growers in the agricultural sector is the main cause of this disorder, failure to comply with ergonomic principles, being in states of poor posture, working with neck and back bent, do duplicate like bending the waist and the use of excessive force during work. Handling heavy loads, such as bags of fertilizer and a lot of injuries to the spine farmers. In fact, more than one billion and 300 million of the world's population engaged in agricultural work. Based on the separation of continental Asia with 57 percent and Africa with 81 percent has the largest share of world agricultural population into account. [4].

Generally, in any country, part of the work done by human beings, devoting this kind work to man is different in different countries, as in industrialized countries this ratio is lower, but Iran is one of the developing countries has a higher percentage of jobs handy, especially in the agricultural profession. In this case, farmers are exposed to musculoskeletal disorders and it is natural that under such conditions, musculoskeletal problems of incidence, prevalence and intensity will be higher. In today's world due to the immense extent of musculoskeletal disorders and

that a large part of the compensation to the affected workers, is related to musculoskeletal disorders, problem prediction, prevention and control of this disease is extremely important. As in developing countries, especially Iran musculoskeletal problems in the various occupations, including agriculture impressive. In agricultural activities all parts of the body may be exposed to stress, but waist, shoulders, hands, knees, wrists and fingers are most at risk. [5] To reduce musculoskeletal problems resulting from poor physical condition, there are several methods to assess body condition, including methods RULA (Rapid Upper Limb Assessments) and (Quick Exposure Check) QEC and OWAS Working Posture Analysis System) Ovako). [6] One useful methods for analysis and control poor working conditions is method OWAS. [7] Consultants jobs in high prevalence and incidence of musculoskeletal disorders can be assessed by OWAS. [8] Safety and health point of view, identifying improper body posture and other body conditions can be checked using visual, more or less sophisticated techniques of assessment, recording and analyzing it. Including the establishment of business analysis techniques, techniques are OWAS. In this method using a structured Table to analyze, evaluate and assess the status of implementation of the body is discussed in practical terms. [9] OWAS approach each situation with a 4 digit code that states the body (trunk, arms, legs and the force applied to the task) notes will be shown, the main elements of the combination (code on the trunk, arms, legs and the force applied to the task) overall situation in prioritizing corrective action (natural (1), stressful (2), harmful (3) and very harmful (4)) will be achieved. [8] In a study on farmers who were doing duty maintenance machinery, forestry, found that about half (47%) of the handle stressful situations, the body, with harmful and very harmful. [10] In 1989, Investigations in America suggests that people suffering from illness and injury are 6,500,000 5,000,000 of musculoskeletal injuries suffer because of inadequate working postures and annual dollar 5,000,000 regardless of the diagnosis and treatment of this disease. [11]

A study in 1998 as the status of the body (posture), rice farmers Babolkenar city of Babol by the 100 rice OWAS in three business lines, transplanting and smooth. In all three stages of rice, 13.53% postures seen in "priority action" 1, 28.34% in the "priority action" 2, 33.16% in the "priority action" 3 and 24. 97% postures seen in "priority action 4". Overall, the three-phase rice, 86.47% postures seen in "priority action" 2, 3 and 4 had real indicating poor postures while rice and can cause musculoskeletal disorders severe and very severe. With results obtained show that a total of three rice about 86.47% postures observed should be corrected immediately and in the near future. [5]

Due to the multitude of activities in the greenhouse and physical activity in inappropriate situations (moving, lifting, standing and sitting, repetitive work, etc.) and in the prevention of musculoskeletal disorders among workers and

reduce the greenhouse and reduce costs resulting from the outcome of this complication, this study aimed to assess the condition of the body and musculoskeletal disorders and associated factors among workers in the greenhouses was Khomeini Shahr city.

Analysis method: This is a descriptive-analytic study on 150 workers in greenhouses on different workstations (pot filling, watering, weeding, pruning and spraying), which were sampling methods was simple. In this study, the demographic profile of workers in the questionnaire (including age, work experience, work stations, education and average daily hours of work, needed work force) arrived and Win Owas software was used to assess the body condition of the workers. As with filming in different workstations based on the average daily working hours, and entering the code posture, trunk, arms, legs and weight of the load in the application, priority action were identified. In this application, each posture is characterized by a four-digit code.

The first digit in the code by OWAS posture defines body posture four choices for different body postures are:

1) Spinal column is stretched and straight.

2) Spinal column is curved.

3) Trunk is rotating.

4) curved trunk and spinning.

The second digit in the code defines posture, posture, arms.

Three choices for different arm postures are:

1) Both arms below shoulder height with.

2) One of the arms at shoulder height or above it.

3) Both arms at shoulder height or above it.

The third figure in the four-digit code determines the posture feet.

7 tickets for different legs postures are:

1) Sitting

2) Stand with legs stretched straight

3) Standing with a straight leg

4) Standing on bent knees

5) Kneeling on one knee bent

6) Kneels on one or both knees

7) Walk or switch

The fourth digit in the four-digit code determines posture and weight load that the amount of time workers have removed.

In coding method to load or force that is required three options are:

1) A force of less than kg10,

2) A force between kg10 and kg20,

3) A force is more than kg20. [8]

Code postures by direct observation and filming continuously for 40-20 minutes at different workstations (pot filling, watering and pruning, weeding and spraying) and were entered in the software. (It should be noted for 30 minutes at different workstations based on the duration of the work was divided at each workstation.) By signing the posture codes, the body will be determined corrective action. Priority corrective action has 4 modes (natural (1) - stressful (2) - harmful (3) - very harmful (4)), which indicates the necessity of an ergonomic intervention in the workplace and preventative measures. Prioritize corrective action based on the magnitude of the risk of musculoskeletal disorders and stress on the musculoskeletal system is determined. With this software at each workstation posture and in all stations with determine the corrective action groups and organs at risk, will be assessed.

Statistical analysis of data using SPSS software and statistical tests X2 (chi-square) and analysis of variance was performed. The values of $P < 0.05$ was considered as significant amounts.

Findings:

Results of present study showed that among the 150 people employed male workers (70-18 years old) in a greenhouse, about 71 people were identified with poor body condition. In this study, body position 150 (working in greenhouses) with a mean age of 14.03 ± 37.33, average work experience 9.13 ± 9.03, the average workday 4.3 ± 6 and in terms of the force required to do the work , As 140 (93.3%) with a weight less than 10 kg, and 10 patients (6.7%) with between 10 and 20 kg weight, and body position in terms of education, so that 20 patients (13.3%) illiterate, 35 (23.3%) elementary, 50 (33.3%) and 45 cycles (30%) and diplomas in different workstations (filling pots, watering, weeding, pruning and spraying) review it placed. According to the X2 test and frequency of the body, between body and age, work experience, average daily hours of work, education and workstation significant relationship ($p < 0.05$), respectively. Between the body and the force required to do $p > 0.05$ there was no significant relationship. The results of the application winowas showed group action, body and limbs at risk in different

workstations. According to Table 1, priority corrective action code postures in Station pot filling, the workstation from the 720 postures (40%) Total postures (1800 postures) 5% postures in Corrective Action 1 and 95% postures in action 2 and 4 respectively. The most frequent posture to posture Code 2161 (35%) in group 2 and corrective action posture Code 4161 (35%) in group 4 are corrective action. In this workstation according to Figure 1 the distribution of organs at risk in the pot filling station, reins to 95% and 85% legs are vulnerable.

According to Table 2 priority corrective action postures Code weed station, on the workstation, the 300 postures (17% of all postures) 100% postures in groups 2 and 3 were corrective action. The most frequent code posture, the posture Code 2161 (60%) in group 2 is corrective action. In this workstation according to Figure 2 . Frequency distribution of organs at risk in weed plants, 100% and 60% back legs are vulnerable. In the branching station of between 120 postures (7% of all postures) 80% in group 1 and 20% corrective action postures in groups 2 and 4 were corrective action. The most frequent posture to posture Code 1121 (80%) in group action 1.

Based on the frequency distribution of organs at risk in pruning plants, 10% are vulnerable waist. In workstation spraying of 60 postures (3% of all postures) 80% postures in group 1 and corrective action (20%) in group 2 underwent corrective action. The most frequent posture to posture Code 1171 Department of Corrective Action 1. Based on the frequency distribution of organs at risk in spraying station, 10% are vulnerable waist.

According to Table 3 priority corrective action postures code on all workstations is around 57% of greenhouse workstation postures observed in 5 priority action 2, 3, 4, situation stress on the body, harmful and very harmful. They should immediately be corrected as soon as possible and in the near future. The most frequent postural are corrective action group 2, 3 and 4 related to posture Code 2161 (24%) and 4161 (14%). Based on Figure 3 on all work stations, greenhouses and 1,800 postural assessments, 56% back, 44% legs are vulnerable.

Table-1: priority action postures Code pot filling station.

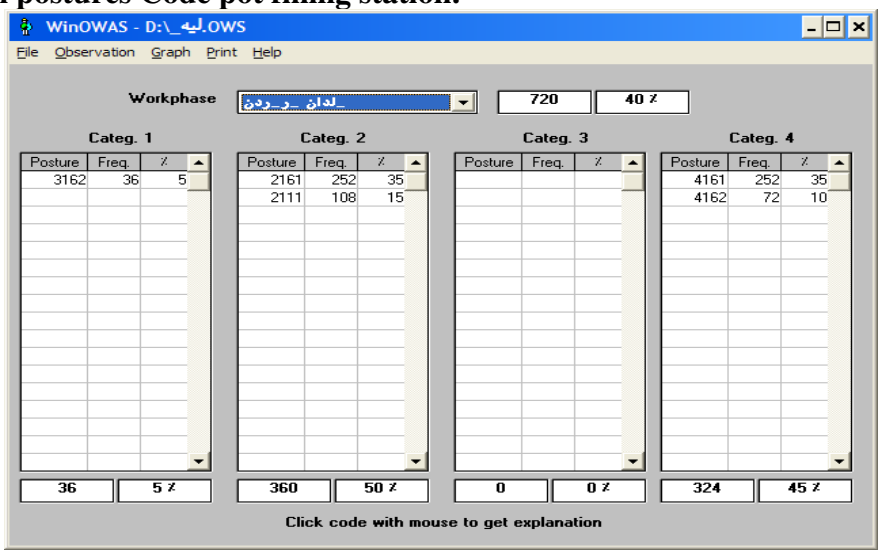


Figure-1: Distribution of organs at risk in the pot filling station.

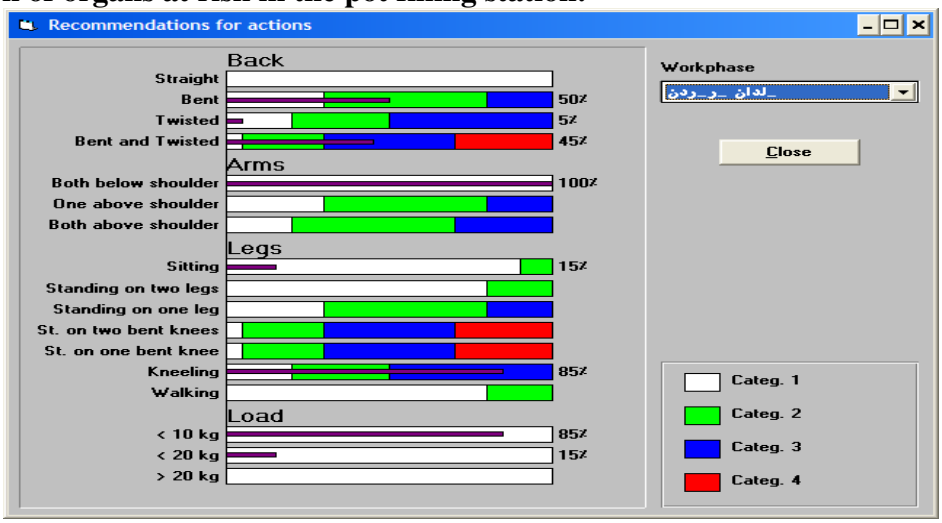


Table-2: Priority action postures Code weed station.

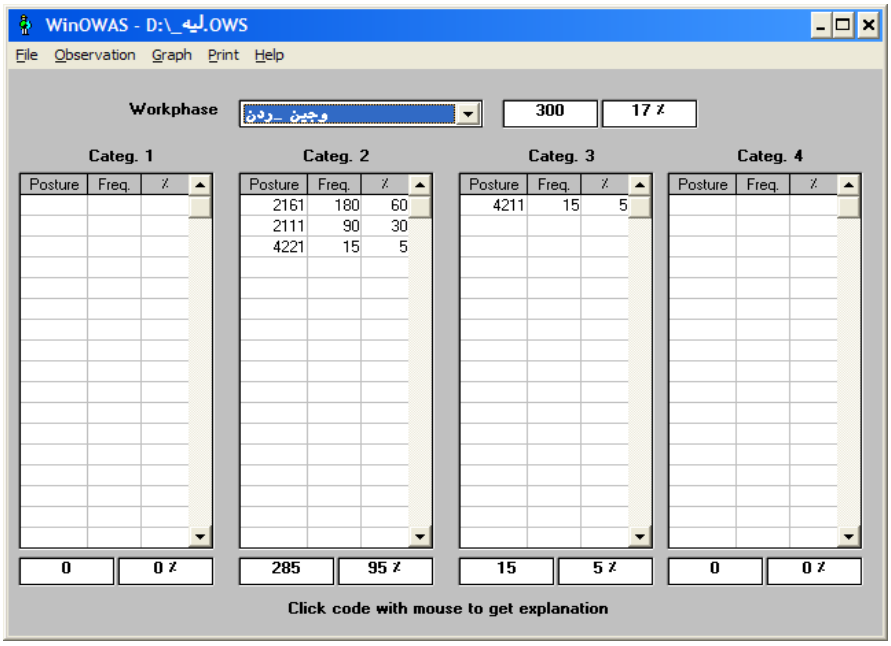


Figure-2: Distribution of organs vulnerable to weed station.

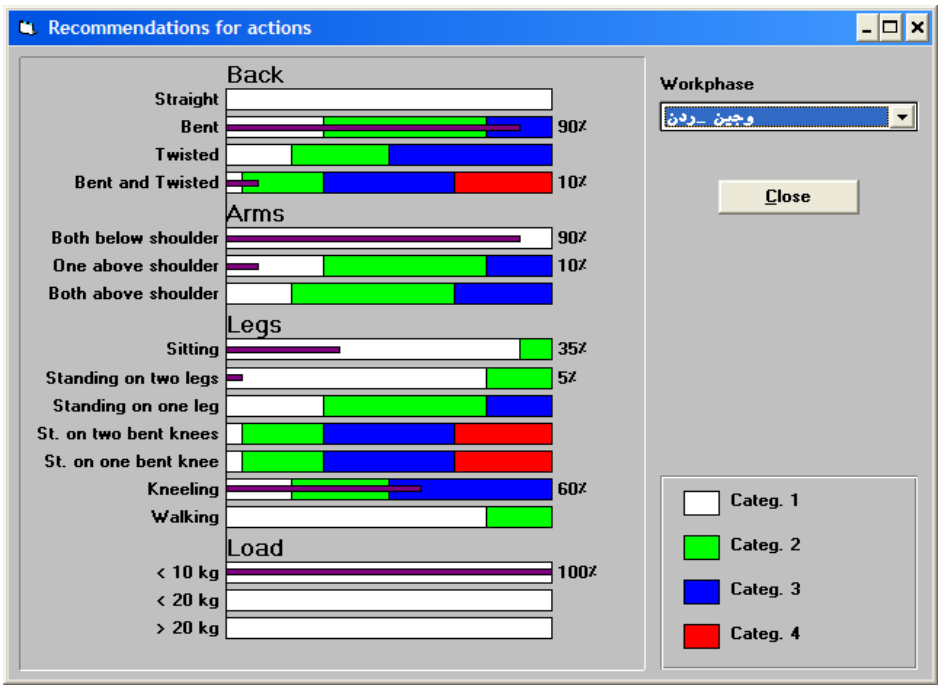


Table-3: priority action postures code on all workstations greenhouse.

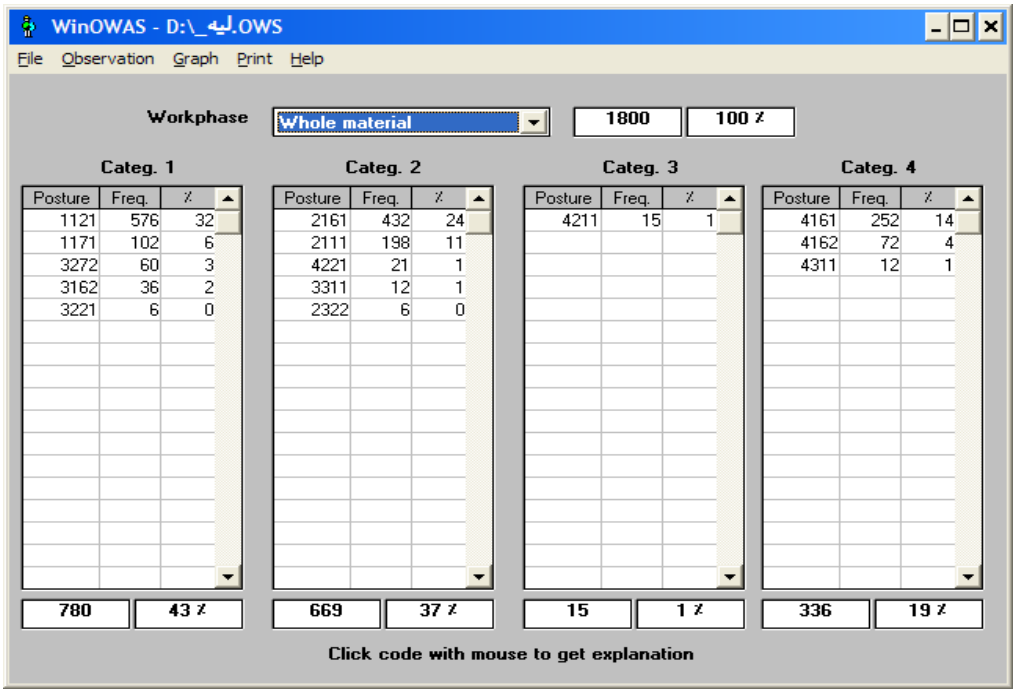
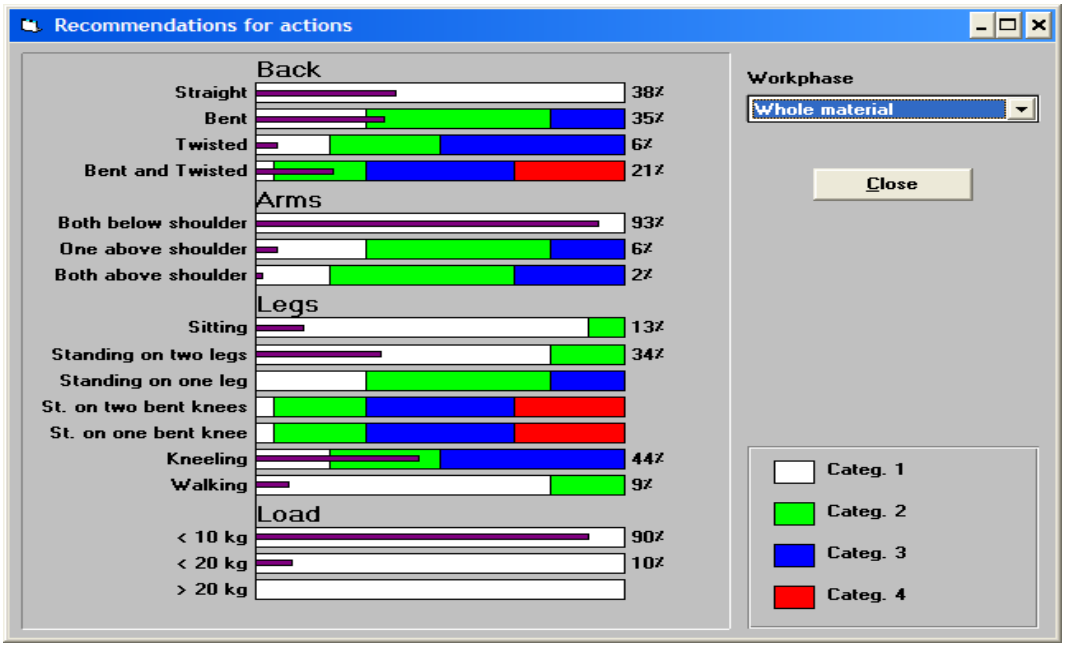


Figure-3: Distribution of organs vulnerable to all workstations in the greenhouse.



Discussion:

Given that among 150 male workers working in greenhouses 47.4% had poor body situation. The result can be used in greenhouses because of the nature of jobs is traumatic. Posture posture assessment 780 1,800 (43%) in group 1 and 669 postural corrective action (37%) in group 2 and 15 posture corrective action (1%) in group 3 and 336 postural corrective action (19%) in group action amendment 4 was used. 57% postures observed in 5 working stations 2, 3 and 4 are corrective measure greenhouse priority stressful body situation, were harmful and very harmful. We conclude that 57% postures should immediately be corrected as soon as possible and in the near future. Among the

most common postures posture to posture Code 2161 (24%) and 4161 (14%) in the filling station and weeding out the pot. Education can be bent at situation back and rotation (Code 2 and Code 4) with access to equipment and design appropriate to the level of spinal column long and straight (Code 1) and legs from kneeling on one or both knees (code 6) change using the appropriate seat and standing with legs stretched straight (Code 2) or sitting (code 1).

In this study maximum prevalence of musculoskeletal disorders related to filling pot plants and weeding out, where poor posture and lower back and legs bent knees on one or both knees bent and back in the rotation. This implies that in intervention of ergonomics in the workplace, taking corrective measures in these stations is a priority. From 1800 postural assessment, 56% was in back, 44% legs are vulnerable. It should be noted highest prevalence of musculoskeletal disorders had been among occupational groups in the back and legs. Between different workstations, filling in pot plants and weeding out poor body posture and back and legs are more vulnerable, so that in pot filling stations, back and legs 95%, 85% and 100% weed station back and legs 60% are vulnerable.

The findings of this study with the results of the study, body condition Babolkenar area city of Babol as owas similar to rice farmers and that generally poor condition of the body and bent at the back and the spinning is and can lead to musculoskeletal effects on the workers. According to the evaluations, poor body situation, and long-term repetitive work, pick up and carry the load, the load height is moved, not enough breaks to rest, among the risk factors for musculoskeletal disorders and observed that these jobs are abundant. This important prompted us to continuous training sessions to promote awareness and action of workers and with proper planning, better and more regular positive step in the right and best practices with particular attention to issues of occupational health and ergonomics to improve the health of the working population survey.

Conclusion:

Considering that 47.4% greenhouse workers had poor body situation, and factors that affect the health of workers in greenhouses, which can include poor working conditions, inadequate attention to work-related risk factors, particularly ergonomic factors and on the other hand age, work experience, workstation, and so on and so far is the inadequate situation the body's musculoskeletal disorders. Therefore it can be suggested, to prevent musculoskeletal disorders, weight loss, objects displaced and the implementation of the work rest cycle to reduce physical stress, business diversification, training workers on proper lifting and carrying techniques, and done mechanization techniques.

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