Working Posture Analysis on Musculoskeletal Disorder to Load-Lifting Workers in the Spice Export Shop UD. Lisa Bahar by Using Ovako Working-Posture Analisys System (OWAS) and Rapid Entire Body Assessment (REBA).

*Denada Florencia Leona [a]**

[a] Andalas University, Dr. Mohammad Hatta Limau Manis, Padang, 25163, Indonesia

A B S T R A C T

Humans who move and work every day have different levels of physical limitations, there are many aspects that need to be taken into consideration when preparing work plans. Without considering these aspects, humans are susceptible to injury when carrying out work that is beyond the human's physical capacity. The most common injuries that occur due to work beyond human physical capacity are musculoskeletal disorders. Musculoskeletal disorders or MSDs are physical complaints experienced by workers in the skeletal muscle department, ranging from mild complaints to severe complaints caused by an imbalance of activity load on muscle and skeletal abilities which significantly directly or indirectly reduces work productivity. The high level of musculoskeletal disorders in workers is driven by an increase in consumer demand for goods which requires an acceleration of the production process, as is the case at the spice export shop UD. Lisa Bahar. Worker at UD. Lisa Bahar still relies on manual handling in the process of transporting and moving goods, the wrong manual handling process can result in injuries, such as musculoskeletal disorders. This study uses the OWAS (Ovako Working-posture Analysis System) and REBA (Rapid Entire Body Assessment) methods to analyze working postures for musculoskeletal disorders in load-lifting workers at UD. Lisa Bahar. In assessing work positions using the OWAS method, a value of 1 was obtained after calculations using tables taking into account the worker's body position including arms, legs, back and load. The work carried out by these workers is in acceptable conditions because it is not dangerous and does not cause problems to the musculoskeletal system of the worker's body. Meanwhile, the working position assessed using the REBA method obtained a score of 11 after calculating the working position of the neck, back, legs, upper arms, lower arms and wrists using score tables A, B and C. The result of the REBA score level for this work was 4 This work has a high risk of danger and action and repairs must be taken as soon as possible.

Keywords: Musculoskeletal disorders, MSDs, Load-Lifting Workers, OWAS, REBA

1. Introduction

Ergonomics is a scientific context that contains factors and characteristics that humans can carry out related to the field of work and obtain usefull information for creating good work system designs. Ergonomics has the main goal, namely creating the best productivity, comfort, safety, and work efficiency by paying attention to the health and safety of workers. Work carried out without paying attention to ergonomic concepts can cause significant losses for workers and the companies involved. Lack of application of ergonomics for workers can result in work discomfort which can result in decreased efficiency and work power, and worse still, without good application of ergonomics, work accidents are very susceptible. Meanwhile, the losses received by the company are high costs resulting from inconveniences and accidents that occur in the workplace.

Industry has advanced significantly with the use of technology and sophisticated machines to carry out production in its work processes, however, some processes are still carried out manually. Humans who move and work every day have different levels of physical limitations, so consideration is needed when preparing work plans. Without considering this aspect, humans are susceptible to injury due to work that is beyond the human's physical capacity. The most common injuries that occur due to work beyond human physical capacity are musculoskeletal disorders. Musculoskeletal disorders or MSDs are physical complaints experienced by workers in the skeletal muscle department, ranging from mild complaints to severe complaints caused by an imbalance of activity load on muscle and skeletal abilities which significantly directly or indirectly reduces work productivity (Jaka Laksana et al., n.d.). Factors that cause the occurrence of musculoskeletal disorders such as stretching muscles too hard and using them for too long can cause damage to joints, ligaments and tendons (Utami et al., n.d.). Statistical data from the European Occupational Diseases Statistics (EOD) states that 59% of the total number of work-related diseases is muculoskeletal disorders and 32% of them are Carpal Tunnel Syndrome (CTS). In Indonesia, musculoskeletal disorders are a direct or indirect result of repetitive manual handling activities with 47% of workers claiming (Jaka Laksana et al., n.d.).

The high level of musculoskeletal disorders in workers is driven by an increase in consumer demand for goods which requires an acceleration of the production process, as in the case at the spice export shop UD. Lisa Bahar. Worker at UD. Lisa Bahar still relies on manual handling in the process of transporting and moving goods, the wrong manual handling process can result in injuries, such as musculoskeletal disorders. Therefore, to reduce the occurrence of injuries and musculoskeletal disorders in workers, it is necessary to measure work posture loads using the OWAS (Ovako Work Analysis System) and REBA (Rapid Entire Body Assessment) methods during work (Sulaiman and Purnama Sari, n.d.).

2. Methodology

The method used to measure the working posture of worker in UD. Lisa Bahar is the OWAS and REBA method. The choice of this method is based on the form of work found in the UD. Lisa Bahar is a job transporting goods that uses the entire body, consisting of the back, arms, legs and body posture. Using the OWAS method is easier and the results of observations can be used as a comparison before and after the intervention in measuring effectiveness. Meanwhile, the REBA method is a method that can measure work posture quickly and specifically compared to other methods. The final REBA score can be used to identify work risk factors and determine priority problems and their mitigation.

OWAS is a method used to analyze work attitudes which are assessed from the movement of the body parts of the back, arms, legs and heavy loads being lifted. The OWAS method assesses basic posture which consists of a sequential four-digit code starting from the back, arms, legs and weight of the load when carrying out manual handling. According to Karhu 1981, in Hakim 2019 there are several forms of classification of body parts that can be observed, analyzed and evaluated (Hasrianti, 2016).

2.1 OWAS (Ovako Working-posture Analisys System)

OWAS is a method used to analyze work attitudes which are assessed from the movement of the back, arms, legs and weight of the load. The OWAS method assesses basic posture which consists of a sequential four-digit code starting from the back, arms, legs and weight of the load when carrying out manual handling. According to Karhu 1981, in Hakim 2019 there are several forms of classification of body parts that can be observed, analyzed and evaluated (Hasrianti, 2016).

1. Back Stance

   - Straight/upright

   - Bend over

   - Rotate or Tilt sideways

   - Bending and twisting or bending forward and sideways

Fig. 1 -Back Work Attitude

2. Arm Stance

   - Both hands are under the shoulders

   - One arm is at or above the shoulder

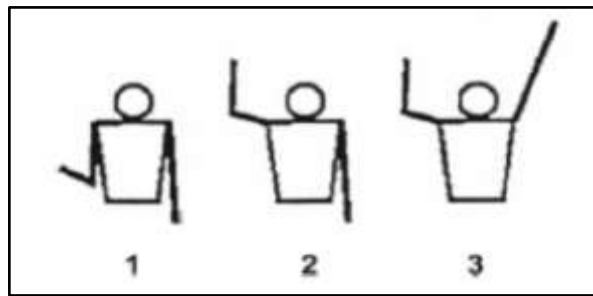   - Both arms are at or above the shoulders

Fig. 2 - Arm Work Attitude

3. Foot Stance

- Sit

- Stand with your legs straight

- Stand on one straight leg

- Stand on both feet with knees bent

- Stand on one leg with your knee bent
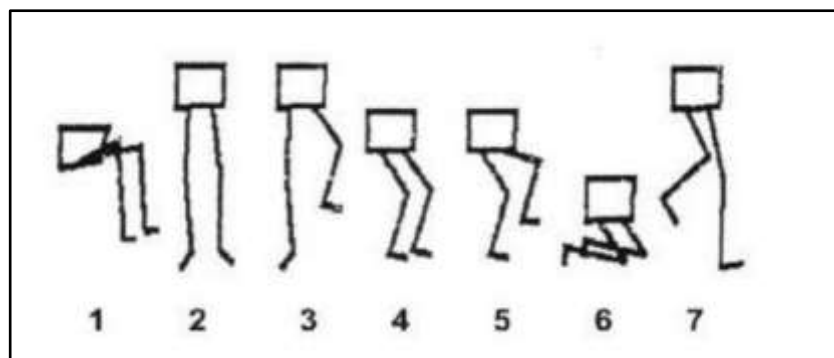
- Kneel on one or both knees

- Walk

Fig. 3 - Work Attitude Of The Feet

4. Heavy load

- The weight of the load is less than 10 Kg (W = 10 Kg)

- The weight of the load is 10 Kg – 20 Kg (10 Kg < W = 20 Kg)

- The weight of the load is greater than 20 Kg (W > 20 Kg)

Work attitude assessment categories:

1. CATEGORY 1: no need for repairs, because there is no problem with the musculoskeletal system.

2. CATEGORY 2: Needs to be repaired, due to a form of tension in the musculoskeletal system.

3. CATEGORY 3: Repairs need to be carried out as soon as possible, measured by the severity of the stress.

4. CATEGORY 4: Needs to be repaired immediately/right now, has created a clear risk.

2.2 REBA (Rapid Entire Body Assesment)

REBA is a method used to quickly assess the working position of the body consisting of the worker's neck, back, arms, wrists and legs. This method collects data on body posture, strength used, type of movement, repetitive movements, and sequential movements. This data produces a score that provides an indication of risks that must be addressed as soon as possible (Bintang and Dewi, 2017). In general, the stages of REBA development are divided into four parts:

1. The first stage is collecting worker posture data using video or photos

2. The second stage is determining the angles of the worker's body parts

3. The third stage is determining the weight of the object being lifted, determining the coupling, and determining the worker's activity.

4. The fourth stage is calculating the REBA value for the posture in question. By obtaining the REBA value, the level of risk and the need for action that need to be taken to improve work can be determined.

3. Result

3.1 Measurement of Work Posture on UD. Lisa Bahar workers using the OWAS method

Fig. 4 -Working Posture of Workers

- Back: From the results of observing the image, the value for the back is 1. This is because in the process of transporting goods, the worker stands with an upright posture.

- Arms: The value for the arms is 2. In the picture you can see the position of the worker's arms, one is below shoulder height and one arm is above shoulder height.

- Feet: The value of the feet is 7. Workers carry goods while walking with the aim of moving goods from one place to another.

- Load: The value that can be given for the load of goods is 1. The goods being transported weigh no more than 10 kg.

3.2 Measurement of Work Posture on UD. Lisa Bahar workers using the REBA method

Fig. 5 -Working Posture on Workers

A.   Neck, Back, and Leg Analysis

1.   Stage 1, Neck position: The neck position in the picture is looking down at an angle >20o, so the neck position score is 2

2.   Stage 2, Back position: The back position in the picture is bent forward at an estimated 60o angle, so the back position score is 4

3.   Stage 3, Foot Position: the foot position in the picture is straight and slightly bent forward at an approximate angle of 30o, so the foot position score is 2

4.   Stages 4-6:

Posture Value A (6) + Load Value (2) = A Value (8)

B.   Analysis of the arm and wrist

5.   Stage 7, upper arm position: The upper arm position forms a contraction of 46o-90o, so the score is 3

6.   Stage 8, Forearm position: the position of the forearm forms an angle >90o, so the score is 2

7.   Stage 9, wrist position: hand position facing up and away from the central axis, so that the score is 3

8.   Stages 10-12:

Posture Value B (5) + Coupling Value (2) = Value B (7)

9. Stage 13: Assess Activities

Table value C (10) + Activity Value (1) = REBA value (11)

4. Discussion

Assessing working position using the OWAS (Ovako Working-posture Analysis System) method obtained a value of 1 after calculations using tables taking into account the worker's body position including arms, legs, back and load. A score of 1 in the assessment using the OWAS method can be interpreted as a Category 1 scale level. On a Category 1 scale, the work carried out by the worker is in an acceptable condition because it is not dangerous and does not cause problems with the worker's musculoskeletal system.

Assessing work positions using the REBA (Rapid Entire Body Assessment) method obtained a score of 11 after calculating the working positions of the neck, back, legs, upper arms, lower arms and wrists using score tables A, B and C. Based on the values obtained, The REBA score level for this work is 4, namely work that has a high risk of danger and action and repairs must be taken as soon as possible

5. Conclusion

Normal body posture is a body posture at work that is in accordance with the body's anatomy without any shifts or pressure on other parts of the body such as muscles, nerves, organs and related bones, so that this posture does not become a burden and causes musculoskeletal disorders and other body systems. Body posture when working really needs to be considered for comfort and safety to support work efficiency and productivity. This work posture can be measured using several methods including the OWAS, RULA, and REBA methods.

Measurement of work posture from two activities carried out by UD. Lisa Bahar workers uses the OWAS and REBA methods. The results obtained from the OWAS method assessment are that the work carried out by the worker is in an acceptable condition because it is not dangerous and does not cause problems in the musculoskeletal system of the worker's body. Meanwhile, when measuring using the REBA method, this work has a high risk of danger and action and repairs must be taken as soon as possible

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