Utilizing REBA Method for Work Posture Analysis of Gallon Shop Employee

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ABSTRACT

Employee productivity, safety, and health are all greatly impacted by work posture, especially in physically demanding settings like water gallon shops. Workers in these stores frequently handle water gallons while performing heavy lifting, repetitive chores, and awkward postures, all of which over time might result in musculoskeletal disorders (MSDs). The Rapid Entire Body Assessment (REBA) method, a well-known ergonomic instrument for assessing the risk levels of work-related musculoskeletal discomfort, will be used in this study to examine the work posture of gallon shop employees. Employee operations like lifting, carrying, and stacking water gallons were observed in order to gather observational data. To assess the degree of risk involved in various tasks, REBA ratings were computed. According to the findings a "Very High Risk" risk level was indicated by the total REBA score of 12, certain postures especially when lifting and carrying big objects fall into high-risk categories and call for prompt ergonomic intervention. This study emphasizes how crucial ergonomic evaluation, therefore REBA method for improving posture at work and safeguarding worker health.

INTRODUCTION

In an industry, human aspects are crucial, particularly for small and medium-sized businesses (SMEs). This is due to the fact that many aspects of the industrial process still directly require human labor, such as transferring materials and manufacturing (Baroroh et al., 2018). Naturally, this is the root cause of a number of issues or illnesses that affect the industrial sector, including musculoskeletal disorders (MSDs), cardiovascular diseases, and work accidents (Nadri et al., 2013). MSDs are currently a major issue in developed nations (David et al., 2008), affecting social and economic situations by lowering productivity and quality of life and raising expenses, health, and salary compensation (Kee et al., 2007).

The environment, techniques, and equipment used at work have a direct impact on a person's capacity to complete a task. The study of ergonomics can be applied to enhance these attributes. Posture of the body during work will be one of the factors examined. The aim of posture analysis is to ascertain the extent to which the task being done increases the risk of sickness.

The findings are consulted in order to offer suggestions for enhancing the workspace and posture (Hignett et al., 2000). The Rapid Entire Body Assessment (REBA) approach is frequently used to assess if workers have musculoskeletal symptoms for all body parts. The implementation of REBA in this research helps to generate more insightful information about the particular activities and positions that present the most danger (Kurnia et al., 2024). The Rapid Entire Body Assessment (REBA) was created to evaluate the postures of workers in the healthcare and other service sectors (Jabbar et al., 2024).

Employee activities at gallon stores typically entail manually lifting and carrying large objects, like water gallons, which weigh an average of 19 liters or 19 kilograms. High levels of physical strength are necessary for this typical job, and workers frequently have to bend or twist their bodies in non-ergonomic ways. Musculoskeletal conditions including lower back discomfort, muscular injuries, or joint diseases can be made more likely by this condition.

The purpose of this study was to assess the work posture of gallon shop employee at XYZ shop using the Rapid Entire Body Assessment (REBA) method. By using REBA approach, possible risks of musculoskeletal problems brought on by work postures that deviate from ergonomic principles can be identified.

RESEARCH METHOD

One employee of the XYZ gallon shop are the subject of this research, which focuses on their work posture, including lifting gallons. The studies scope was carried out at the XYZ gallon shop at Mataram City, West Nusa Tenggara (Figure 1), where conduct to observe the employees work posture during their activities. Rapid Entire Body Assessment (REBA) is one of the techniques used to measure posture. A technique created in the field of ergonomic, REBA can be used to quickly evaluate an operator's work position (McAtamney et al., 2004). Based on REBA analysis, it is possible to determine whether or not an employee's posture needs to be improved in order to lower workplace risks (Lowe et al., 2019). The changes can then be implemented while creating the work system.

Figure 1. XYZ gallon shop

This research conducts a several methodical steps to guarantee that the information gathered is correct and pertinent. Some of these phases consist of:

1. Data Collecting

   Direct observations were made in the field, where data collecting used cameras to document workers labor actions. This is to get a visual representation of how the body is positioned while functioning.

2. Posture Analysis

   To calculate the score, posture recordings are examined using REBA method. Apps like Sketch or Angulus were used to evaluate the posture's angle, which aids in calculating the posture evaluation score for both approaches combined. By determining the primary body posture angles: trunk, neck, leg, upper arm, lower arm, and wrist. The degree of inclination and movement in each position determines its score.

3. Score Calculation

   A score is computed using the standards established by the REBA techniques once the angle of the body posture has been established. This number will give you an idea of how much risk the employee is exposed to.

4. Results Interpretation

   The score computation results will be categorized into risk groups based on each method's standards. It's critical to comprehend the extent of potential harm that could result from the observed work posture.

5. Suggestions for improvement

   Based on the analysis results, researchers will offer recommendations for enhancements to employees work environments or posture. These suggestions are meant to reduce the likelihood of musculoskeletal disorders while also improving worker comfort and output.

RESULT AND DISCUSSION

The work posture activity observed in the employees of the XYZ water gallon shop is lifting a 19-liter water gallon from the floor or storage rack to be placed on a pick-up truck. This activity involves a series of body movements, starting from taking the starting position to completing the placement of the gallon in the car. The following is a description of the stages:

1. Preparation
   - Employees take their starting position near the gallon to be lifted, usually in a bent or kneeling position to reach the gallon.
   - Often, the starting position is not ergonomic, with the legs out of alignment and the back hunched.

2. Gallon Lifting
   - At this point, the entire weight is supported by the body, particularly the arms, legs, and lower back, and the gallon is raised with both hands.
   - There is frequently a noticeable back tilt angle in body posture, and the gallon grip is not always steady.

3. Carrying Gallons
   - Once raised, the gallon is moved in the direction of the vehicle. To maintain balance, this movement typically entails taking tiny steps while maintaining a forward-leaning stance.
   - Due to the effort required to sustain the load with one side of the body being more dominant, the employee's body position may occasionally be tilted.

4. Placing the gallon over the vehicle
    - The gallon is lifted to a height above the waist and set atop the vehicle.
    - This procedure frequently calls for additional strength due to the pick-up truck's considerable height. Typically, to make sure the gallon is in place, the neck and back are bent.
5. Finishing
    - Once the gallon has been successfully positioned, the worker moves it about to make sure it stays stable.
    - The worker returns to the initial position to raise the subsequent gallon as the action comes to a close.

Figure 2. 1.) Upper arm, 2.) Lower arm

Figure 3. 1.) Wrist, 2.) Neck

Figure 4. 1.) Trunk, 2.) Leg

Table 1. REBA Score

Work Posture	Adjusment angle	Score
Neck	24.5º (twisted neck)	2+1=3
Trunk	42.3º	3
Leg	70º (leg bending unstable)	2+2=4
Total score A = 10 (load > 22 lbs +2)		
Upper arm	42.3º (shoulder raised)	2+1=3
Lower arm	120º	2
Wrist	21º (wrist twisted)	2+1=3
Total score B = 7 (hand hold not acceptable but possible, poor +2)		
Total Score C = 11+1 (repeatable activity) = 12		

An analysis of the poster based on table 1 is provided below:
- Neck: Shows that the neck and head is twisted when the gallon being moved, it can be illustrated from Figure 3 the adjustment angle is 24.5º. As a result, base score delivered +2 and added +1 if neck is twisted when employee did gallon lifting.
- Trunk: Working with a slumped posture (42.3º), score obtained 3.
- Leg: Displays bending leg (+2) and unstable posture when raising the gallon (70º) +2
- Upper arm: With an angle of 42.3° (+2), a large lifting force is causing the shoulder to be raised +1.
- Lower arm: When lifting, bending at a 120° angle (2).
- Wrist: The wrist is twisted (+1) at an angle of 21° (+2), which is not neutral.

Total score from section A and B was indicated of 12, which is a very high risk found in the study utilizing the REBA method. Particularly when workers must maintain enormous weights, these extremely high scores are a reflection of bodily imbalances and severe stress on specific body regions. Given the extremely high of risk, prompt immediate action is necessary, such as enhancing work procedures or implementing tools to lessen the physical strain on employees.

The following suggestions from Gur et al. (2024) for enhancement are based on the findings of the work posture analysis conducted using the REBA method in order to lower the risk of musculoskeletal illnesses among XYZ water gallon shop employees:

1. Using Appropriate Lifting Methods

   Learning safe lifting techniques is one of the most important things to do. Workers should be instructed to lift heavy objects, such gallon jugs, with their legs rather than their backs. Maintaining a straight back, lifting without leaning over, and maintaining the legs parallel and slightly bent are all examples of proper lifting technique.

2. Availability of Ergonomic Assistance

   Employers must use ergonomic aids to lessen the physical strain they bear. Since lifting gallons can put strain on the arms and back, it is advised to have tools like dollies, trolleys, or gallon lifters available.

3. Improved Management of Workload

   A more efficient workload must be set up in order to lessen the physical strain that employees bear. One strategy is to cut down on the amount of time spent lifting gallons at once and to make sure there are enough rests in between tasks. Task rotation plans and effective time management can ease physical strain on workers' bodies and promote muscle recovery.

4. Enhancement of the Workplace and Workplace Position

   The workspace needs to be improved. For instance, it should be built so that employees can easily reach the gallon that needs to be lifted without having to bend or stretch their bodies too far. Furthermore, the gallon storage area needs to be sufficiently spacious and orderly to let workers to work more freely without being constrained by small areas.

CONCLUSION

According to the analysis's findings, lifting a 19-liter gallon of water frequently involves non-ergonomic body postures such bending over and an unstable position, which raises the risk of hand, back, and neck injuries. This non-ergonomic posture is mostly caused by extended work hours, an unsuitable body position, and a lack of lifting assistance. In order to lessen the physical strain that employees endure, it is advised that adjustments be made right once by introducing tools and adopting more ergonomic work practices. These actions are intended to reduce the long-term risk of damage while also maintaining employee productivity and wellness.

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