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Health hazards among workers engaged in loading/lifting tasks in animal feed factory

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Abstract
India is one of the most populated countries in the world and most of the people engaged in the manual work in construction, agriculture and in the informal work. Workers engaged in manual material handling tasks claimed for body stress, sprains/strains, fractures and discomforts of the musculoskeletal system. Therefore, the present study was conducted in animal feed factory in Hisar city on 50 respondents, to study the health hazards among loader/lifters due to loading or lifting**.** Data was collected by using of the interview schedule and observation sheet. Human body map was used for assessing the discomfort level in the different body part and Ovako Working Posture Analysis System (OWAS) and Rapid Entire Body Assessment (REBA) were used to evaluate the different body postures adopted by the workers engaged in loading and lifting. It has been concluded that workers were involved in the loading, lifting, carrying and holding activities and faced the back and shoulder pain problem during the loading and lifting activities. Lower back, legs and shoulders were the most affected part of the body of workers and lifting activity required the corrective measures immediately due to very high risk on the health of workers. There was a need to change their postures and used some equipment or tools which can be helpful in decreasing the health hazards faced by the workers engaged in manual materials handling tasks such as loading and lifting activities.

Keywords: Manual materials handling tasks, loading and lifting activities, health hazards

Introduction
Manual material handling task is defined as the handling or transporting the loads manually. It includes different activities like loading/lifting, lowering, carrying, pushing and pulling, holding or restraining. It occurs in every occupational work environments like factories, warehouses, storerooms, mills, farms etc. Manual material handling is a cause of the musculoskeletal disorders and very hazardous health problems are the most critical problems globally faced by the workers at different workplaces. In the developing countries, the problems of musculoskeletal disorders due to manual material handling tasks (MMHT) are very serious. The musculoskeletal disorder is defined as an injury, illness or disease that arises from the manual handling of the loads at the workplace, whether occurring suddenly or over a prolonged period of time. According to the Bureau of Labor Statistics 2001 report, lifting of heavy items is one of the major causes of injury at the workplace. Kim *et al*. 2005 [4] concluded that approximately 70–85% of people experiencing lower back pain (LBP) due to manual material handling tasks and it became a large socioeconomic burden in Korea. Across Canada, many workplaces are experiencing an increase in the number of muscular skeleton injuries. According to Singh *et al.* 2010, 80 percent of females reported the headache problem due to carrying the load on the head and Abdulrahman M Basahel 2015 [1] concluded that lifting the products in the warehouses was most ergonomically hazardous than pulling the products. According to the above literature, manual material handling tasks (MMHTs) are very hazardous for the human health or viewing the problems and seriousness executed in various manual material handling tasks (MMHTs), it becomes important to carry out the study on the problems and mitigating measures in manual material handling tasks (MMHTs). The present study was conducted on the workers engaged in loading and lifting activities in the factory of animal feed to find out their problems faced by them. The present study was conducted with the following objectives:

- To find out the working conditions of the workplace.
- To find out the health hazards among workers in loading and lifting.

Methodology

To conduct the study, a factory unit of animal feed of Hisar city was purposively selected. From the factory unit 50 respondents were selected randomly who were involved in loading and lifting tasks and willing to corporate. Interview schedule for general information and observation sheet for environmental conditions were prepared and REBA, OWAS and Human Body Map (five-point continuum scale) for body discomfort were used to collect the information. Averages, frequencies, percentage and weighted mean score were calculated.

Results

General information of the respondents: Results in table one reveals the general information of the respondents i.e. age, education, and income. Half of the respondents (50%) belonged to the age group of 35-40 years followed by 30 percent respondents who belonged to the age group of 30-35 years whereas less than one-third of the respondents belonged to the age groups of 25-30 years.

Table 1: General information of the respondents n=50

Parameters	Frequency	Percentage
Age (year)		
25-30	10	20
30-35	15	30
35-40	25	**50**
Education		
Illiterate	15	30
Up to middle	25	50
High school	10	20
Income (rupees)		
Up to 8,000	20	40
8,000-10,000	30	60

Half of the respondents were educated up to the middle level and 30 percent of respondents were educated up to the high school. Majority of the respondents (60%) had the income in the range of Rs. 8,000-10,000 and less than half (40%) of the respondents had the income Rs. 8,000.

Table 2: Physical parameters of the respondents n=50

Parameters	Mean score
Height (cm)	159.81±6.22
Weight(cm):	55.26±6.05

Physical parameters of respondents: Results in table no. two reveals the physical parameters of the respondents. The mean height of the respondents was 159.81±6.22cm with the mean weight of 55.26±6.05 kg.

Body composition/body type according to the Quetelet index: Finding in table no. three shows the majority of the respondents (55%) were having Quetelet index score 20-25 which mean they had mesomorph body type.

Table 3: Body composition/body type according to the Quetelet index n=50

S. No.	BMI (kg/m^2) Score	Body type	Description	Percentage
1.	<20	Ecto-morphs	Slender, very thin body	15
2.	20-25	Meso-morphs	Athletic type body	55
3.	>25	Endomorph	Abdominal physical type	30

Further 30 percent respondents were endomorphs with maximum fat in the body with Quetelet index score >25. A few percents of respondents (15%) were having ectomorph body type with <20 score and low-fat content (very thin body).

Risk factors of loading activity in the animal feed factory: Table no. four describes the risk factors of the loading activity i.e. weight, distance, repetition, resting hour, material and size in the factory of animal feed. It was found that weight carried by respondents was up to the 50 kg and size of material was 24*36 inch with the distance of 10-30 feet in the repetition of two times per minute which were not up to the recommendation level.

Table 4: Risk factors of loading activity in the animal feed factory n=50

S. No.	Parameter	Findings	Recommended
1.	Weight	Up to 50 kg	20-25kg
2.	Distance	10-30 feet	Depend on the area of standing vehicle
3.	Repetition	Two times/min (Depend on distance)	Repetition in 30 sec or less is very risky
4.	Resting hours	Depend on the work	NA*
5.	Material	Medium to hard	NA*
6.	Size	24*36 inch	Should not be more than 75 cm

*NA- not applicable

Resting hours of respondents were depending on the availability of work i.e. more or less and the material carried by them was medium to hard in term of softness.

Table 5: Environmental conditions in the factory of animal feed (One factory)

S. No.	Parameters	Observation	Recommended
1.	Temperature	22 degree C	(19-26 degree C)
2.	Humidity	65%	30-35%
3.	Light	60 lux	50-150 lux
4.	Noise	90-110 dB	70-75dB
5.	Floor	Unequal /uneven surface	Floor surface should be even

Environmental conditions in the factory of animal feed: Environmental conditions of the factory are explained in table no. five. Temperature and light were the 22^0C and 60 lux respectively which were according to the recommendation level. Whereas, humidity, noise and floor level i.e. 65%, 90-110 dB and uneven surface respectively were not up to the recommended level. There were needs to change the environment parameters.

Table 6: Involvement of respondents in different activities: n=50

S. No.	Activities	Frequency *	
1.	Loading	50	In repetition
2.	Lifting	50	
3.	Carrying	50	
4.	Pulling	50	
5.	Pushing	50	

*= multiple response

Involvement of respondents in different activities: All respondents were included in all type of activities which were loading, lifting, carrying, pulling and pushing but in the repetition.

Working experience of the respondents: Working hours of respondents were 8 hours and sometimes depends upon the seasons of the work i.e. more or less work.

Table 7: Working experience of the respondents: n=50

S. No.	Parameter	Observation
1.	Working hours	8 hours or depending on seasons (including night time)
2.	Year of working:	
	2-4	10(20)
	4-6	15(30)
	6-8	25 (50)

Half of the respondents had the experience of 6-8 years followed by 30 percent respondents who had the 4-6 years experience and only 20 percent respondents had the 2-4 years experience.

Physical Discomforts faced by the respondents: Table no. eight reveals that a very high majority (80%) of respondents were facing the back pain problem followed by fatigue and shoulder (70% for each) and joint (64%) pain.

Table 8: Physical discomforts faced by the respondents: n=50

S. No.	Parameters	Frequency *	Percentage *
1.	Fatigue	35	70
2.	Pain Leg Shoulder Back Joint	 26 35 40 32	 52 70 80 64
3.	Allergy	30	60
4.	Redness	27	54
5.	Fractures	7	14

*= multiple response

Allergy was also a problem which was observed in the 60 percent respondents and redness in 54 percent respondents. Only 14 percent of respondents were faced with the fracture problem during the work.

Table 9: Precautions used by the respondents during the work: n=50

S. No.	Precaution	Frequency *	Percentage *
1.	Medicine	7	14
2.	Rest	50	100

*= multiple response

Precautions used by the respondents during the work: It was found that all respondents were taken the rest after the work as the precaution and only 14 percent of respondents were taken the medicine as the precaution.

Equipment used by respondents: It was also found that cent percent respondents were used the hook for pulling the material whereas only 20 percent of respondents were used the pithu for loading as the precaution.

Table 10: Equipment used by respondents n=50

S. No.	Precaution	Frequency *	Percentage *
1.	Hook for pulling	50	100
2.	Pithu (load supporter) for loading	10	20

*= multiple response

Analysis of Human Body Map: Human body map was used for assessing the discomfort level in the load carrying among respondents. According to the human body map lower back was the most affected part of the body got the first rank with the WMS 4.6 followed by shoulders which got the second rank with the WMS of 4.5, back (3.9) and upper back (3.7).

Table 11: Analysis of Human Body Map of the respondents n=50

S. No.	Body part	WMS *	Rank
1.	Neck	3.9	III
2.	Shoulders	4.5	II
3.	Upper arm	3.6	V
4.	Lower arm	2.5	VII
5.	Wrist	3.0	VI
6.	Upper back	3.7	IV
7.	Lower back	4.6	I
8.	Thighs	2.5	VII
9.	Knees	2.1	IX
10.	Legs	2.2	VIII

*= multiple response and WMS- Weighted Mean Score

Whereas, knees and legs were the least affected parts of the body. In the table, rank 4.6 indicated the highest affected part of the body, WMS 3.0 indicated the medium affected part and WMS 2.1 indicated the least affected part of the body.

Table 12: OWAS analysis for different stages of load carrying task n=50

Stages	Back	Arms	Legs	Load	Action category	Action required
Lifting	2 (Bend forward, backward)	3 (both arms are at or above shoulder level)	7 (standing or squatting)	3 (more than 20 kg)	4	Corrective measures immediately
Carrying	3 (Twisted or bent sideways)	3 (both arms are at or above shoulder)	3 (walking with the weight)	3 (more than 20 kg)	3	Corrective measures as soon as possible
Landing	4 Bent & twisted	1 (arms are below level)	4 (standing)	1 (less than 10 kg)	4	Corrective measures immediately

OWAS analysis for different stages of load carrying task: Ovako Working Posture Assessment analysis of each stage of load carrying activity was done by observing the activities. The table shows that the posture adopted in lifting and landing the load were most critical and got the 4 score. These activities required the corrective measures immediately. Carrying posture got the action category of 3 that meant that corrective measures as soon as possible.

REBA Analysis of load carrying task: T Table no. 13 shows the REBA analysis of loading carrying task in three stages: lifting, carrying and landing the load. Each stage was analyzed carefully through Rapid Entire Body Assessment (REBA). According to REBA analysis, lifting and landing were the most hazardous activities due to the adoption of bad posture.

Table 13: REBA Analysis of load carrying task n=50

Stages	Score A	Score B	Score C	Final score	Action required
Lifting	10	11	12	15	Very high risk implement change
Carrying	5	10	8	9	High risk, investigated and implement change
Landing	7	10	11	12	Very high risk implement change

The REBA score calculated as 15 and 12 respectively which indicated that the tasks involved very high risk and there was a need to implement change. In carrying the load the REBA score calculated as 9 which also indicated that the task involved high risk and required action was needed investigation and implement change. REBA score shows that lifting and landing are the very risky tasks than the carrying.

Conclusion:

Manual materials handling (MMH) means moving or handling things by lifting, lowering, carrying, pushing and pulling, holding or restraining. MMHT is the main cause of the musculoskeletal disorders. It has been concluded that the environmental conditions of the workplaces were not according to the recommendation. All respondents were involved in the loading, lifting, carrying, holding etc. Majority of the respondents faced the back and shoulder pain problem during the loading and lifting activities. According to the human body map lower back, legs and shoulders were the most affected part of the body of workers. According to the OWAS sheet, lifting, carrying and landing activities required the corrective measures immediately. There were the needs to change their postures and used some equipment and tools which may help in decreasing the hazards or problems faced by them.

References

1. Basahel AM. Investigation of work-related Musculoskeletal Disorders (MSDs) in warehouse workers in Saudi Arabia. 6th International Conference on Applied Human Factors and Ergonomics (AHFE 2015), 2015.
2. European Agency for Safety and Health at Work - http://osha.europa.eu
3. Ergonomics Guidelines For Manual Handling, Version # 1.0 Created Last Revision Date: June 2013. Developed by Tim Black PT, Occupational Health Consultant, Jan, 2012.
4. Kim HS, Choi JW, Chang SH, Lee KS, Oh JY. Treatment duration and cost of work-related low back pain in Korea, J of Korean Medical Science. 2005. 20(1):127-131.
5. Singh S, Sinwal N, Rathore H, Sinwalindury H. Health hazards related to manual material handling tasks. Asian. J Home sci, 2005, 5(1).
6. Nussbaum MA. A book on ergonomics and occupational biomechanics: an introduction. Industrial & systems engineering! Blacksburg, va! Usa! 2005.
7. Jhun, Park JY. Estimated number of Korean adults with back pain and population-based associated factors of back pain: data from the fourth Korea national health and nutrition examination survey, J of Korean neurosurgery society. 2009. 46(5):443-450.
8. Guidelines for manual material handling human resources and Environment, health & safety, November, 2011
9. Kumar M, Kushwaha SM, Agrawal S. Evalution of load lifting capacity of female worker in construction work by using a fuzzy logic approach. International journal of scientific & engineering research, 2013, 4(6).