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Occupational health hazard assessment of grain collection workers in Hisar

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Abstract
Agricultural tasks are carried out mainly through manual efforts. Grain handling workers suffer through from musculoskeletal disorder problem due to working in awkward posture with heavy load and repetitive work at different places in the workplace of grain. The study was conducted in Hisar district of Haryana state. Fifty male and female respondents were selected randomly. Results found that Body part discomfort (BPDS) was mostly found in lower back (3.74) followed by knee (3.30) and least in feet (1.14). Health problem scores were found to be highest in backache (WMS-3.64) followed by shoulder pain (WMS-2.84) and stomach pain (WMS-1.12).

Keywords: Occupation, musculoskeletal disorders (MSDs), workers and BPDS

Introduction
Agriculture is one of the major occupations in India. Agricultural tasks are carried out mainly through manual efforts. Grain handling workers perform many strenuous activities such as cleaning, collection, lifting, carrying and loading etc. During these activities they suffer from many health problems like headache, breathing problem, skin irritation/itching and musculoskeletal disorder problems (MSDs). Grain handling workers suffer from musculoskeletal disorder problem because of working in awkward posture with heavy load and repetitive work at different places in the workplace of grain. Agricultural workers are experience with most common type of work-related musculoskeletal disorders (MSDs) injuries due to repetitive motions of heavy lifting while performing tasks (Jadab, 2012) [4]. Load handling, i.e., lifting and carrying heavy load of grain filled sacs is the major job component in these organisations.

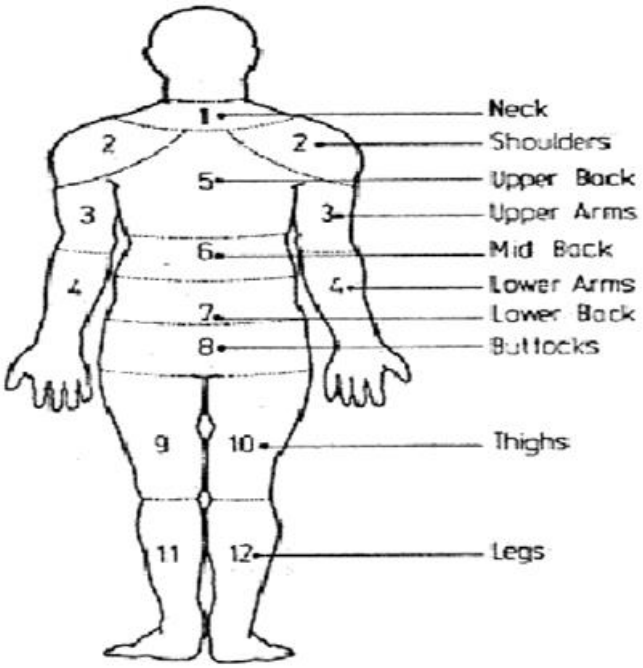
Often, the workers have to adopt awkward postures to carry out the job. Working with heavy load in awkward posture leads to physiological strain and musculoskeletal problem. According to a survey of self-reported work-related illness (Jones *et al*., 1998) [5]; approximately forty-three thousand agricultural workers from Britain ascribe musculoskeletal symptoms to their work, including 62.7% with back pain, 23.2% with upper limb or neck complaints and 25.5% with work related musculoskeletal disorders (MSDs) of the lower limb. On the other hand, agriculture workers exposed to grain dust in storage air suffers from respiratory, allergic and patho-physiological disorders. Grain dust has also long history of association with various diseases, and it has adverse effects on various organs such as eyes, nose, skin, lung and the airways (Hurst & Dosman, 1990) [3]. Therefore, the main aim of this investigation was to know the level of occupational health hazards among grain collection workers during the performance of work.

Methodology
A sample size of 50 respondents were randomly selected from Anaj Mandi of Hisar district in Haryana State. Out of which 38 were male and 12 were females.

Musculoskeletal discomfort during work was assessed through Human Body Map (Corlett and Bishop, 1976).

Human body map: It is used to measure the localized discomfort, musculoskeletal discomfort and intensity of pain in different body parts resulting from the postural discomfort. Body part discomfort score is obtained using modified Human Body Map given by Corlett and Bishop, 1976. In this technique the body is divided into a number of regions. After performing the work, subjects are asked to indicate discomfort in body parts on 5-point continuum ranging

from 1-5 i.e. very mild (1), mild (2), moderate (3), severe (4), and very severe discomfort (5). The weighted mean scores is derived to reach at the conclusion.



Results and Discussion

Table 1: Socio economic profile of the respondents (n=50)

Sr. No	Variable	Categories	Frequency	Percentage
1.	Age	30-40	32	64
		41-50	13	26
		51-60	5	10
2.	Gender	Male	38	76
		Female	12	24
3.	Education	Illiterate	33	66
		Primary	11	22
		Middle	6	12
4.	Caste	General	3	6
		BC	17	34
		SC/ST	30	60
5.	Family type	Nuclear	37	74
		Joint	13	26
6.	Family size	1-4(members)	4	8
		5-7(members)	25	50
		Above 7(members)	21	42
7.	Monthly income	5000-10000	35	70
		10001-15000	11	22
		Above 15000	4	8

Age: table 1 reveals that maximum numbers of respondents (64%) belonged to 30-40 years of age followed by 41-50years (26%) and age group of 51-60 (10%) respectively.

Gender: The data depicted that the majority of the suffering from MSDs were male (76%) followed by females (30%).

Education: The data indicated that majority of the respondents (66%) were illiterate level followed by primary (22%) and middle level education (12%) respectively.

Caste: Presented in table 1 are the results pertaining to caste which reveals that (60%) of the respondents were belonging to SC/ST category, followed by 34 percent of respondents were belonging to BC category and only 6 percent were in general category.

Family types: data regarding distribution of the respondents on the family types showed that majority of the respondents were living in nuclear families (74%) followed by joint families (26%).

Family size: The data reveals that half of the respondents (50%) were having middle size families of five to six members followed by large size families (above seven members) (2 %) in their families.

Monthly Income: The results indicate that majority of the respondents (70%) were earning b/w 5000-10000 per month followed by 22 percent who were earning ₹10001- 15000 per month. Only 8 percent respondents were having monthly income above ₹15000.

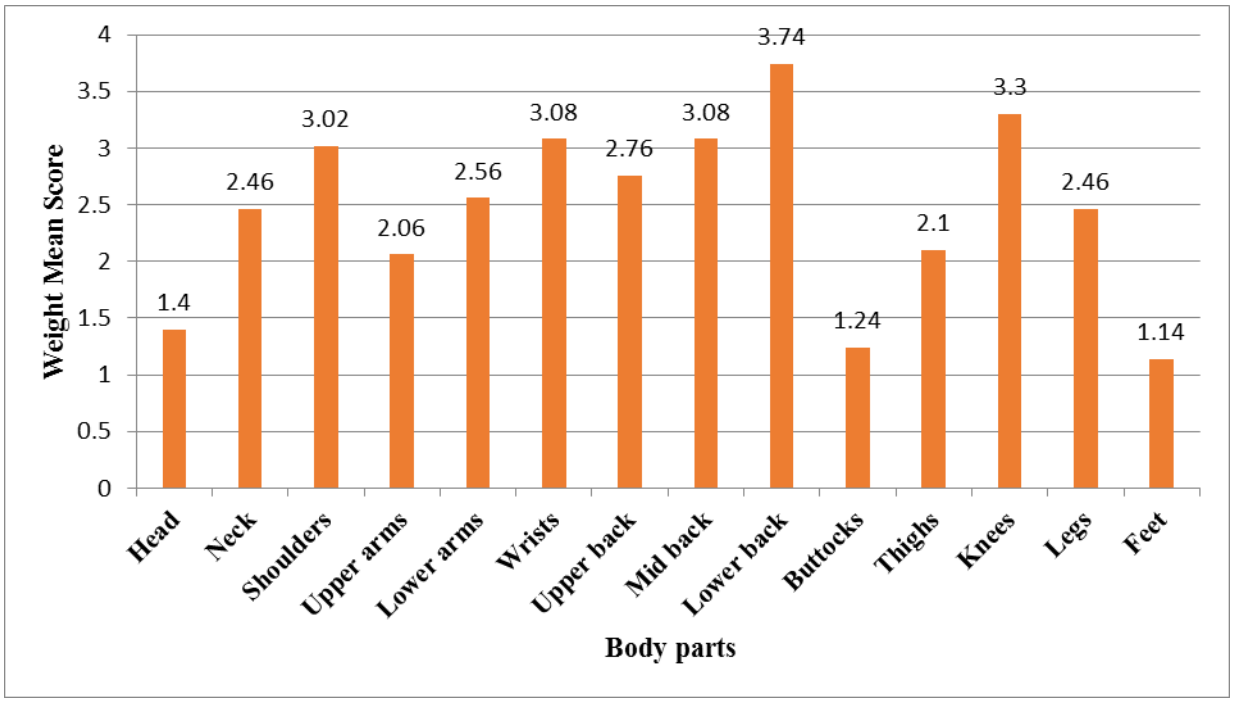


Fig 1: Musculoskeletal discomfort in different body parts using BPDS while grain collection (n=50)

Fig. 1 illustrates level of musculoskeletal discomfort in different body parts while doing the activity of grain collection. Weighted mean score of discomfort of different body part was calculated and presented. High discomfort was felt in the lower back (WMS – 3.74) followed by knee (WMS - 3.30), mid back and wrist (WMS - 3.08) and Shoulders (WMS – 3.02). Moderate discomfort was found in upper back (WMS – 2.76), lower arms (WMS – 2.56), neck and leg (WMS – 2.46), thighs (WMS -2.10), upper arms (WMS- 2.06) whereas, light discomfort was felt in the head (WMS – 1.40), buttocks (WMS- 1.24) and feet (WMS - 1.14) while working for grain collection. Similar study according to Paul *et al.* (2019) reported that musculoskeletal disorders were found to be maximum 32.38% in the lower back followed by knee (30.95%), neck (12.86%), shoulder (12.38%) and upper back (12.38%). Further studies found that discomfort in lower back (68.9%) followed by knee (39.6%), chest (34.3%), leg (31%), hand (30.3%), upper back (27.6%), neck (26.9%), ankles (20.7%), shoulder (19.3%) and elbow (4.1%). Reported that the average discomfort symptoms of body parts of rice mill workers were 3 out of 10 different body parts (Biswas *et al.* 2019) [1] and (Gupta and Tarique 2013) [2].

Table 2: Health problem faced after the activity/ work (n=50)

S. No.	Type of health problem	WMS	Ranks
1	Headache	2.34	IV
2	Neck (cervical) pain	2.54	III
3	Shoulder pain	2.82	II
4	Backache	3.64	I
5	Chest pain	1.16	VIII
6	Stomach pain	1.12	IX
7	Leg pain	1.68	VI
8	Hand pain	1.98	V
9	Skin irritation/itching	1.20	X
10	Breathing problem	1.52	VII

Data interpretation that health problem scores were found to be highest for backache (WMS-3.64), followed by shoulder pain (WMS-2.84), neck pain (WMS- 2.54), headache (WMS-2.34), hand pain (WMS-1.98), leg pain (WMS-1.68), breathing problem (WMS-1.52), skin irritation/itching (WMS-1.20), chest pain (WMS-1.16) and stomach pain (WMS-1.12). Similar study found that Rice mill workers were suffer from discomfort feeling in different body parts and maximum discomfort reported in lower back sixty-eight percent (Biswas *et al.* 2019) [1]. Further study found that musculoskeletal discomfort were maximally reported in knee by 59% depot workers whereas low back and knee was reported by 61.5% rice mill workers (Pradhan *et al*. 2007) [7].

Conclusion

Finding of the present study shows that majority of them were of the age group of 30-40 yr (64%), belonging to SC/ST category (60%), were illiterate (66%), having nuclear families (74%) with medium size family (50%) and with a monthly earned between Rs. 5,000-10,000 (70%).

Found that body part discomfort (BPDS) high in lower back (3.74), moderate discomfort in upper back (2.76) and low discomfort in feet (1.14).

Health problem scores were found to be highest in backache (WMS-3.64) followed by shoulder pain (WMS-2.84) and stomach pain (WMS-1.12).

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