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Constraints faced by load carrying workers of grain market in Haryana state

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Abstract

Mandi labour, like agricultural labour in fields, plays an important and intensive role in agricultural regulated markets. Mandi labour is defined as labour that works in regulated agriculture markets or mandis during the mandi season, i.e. when crops arrive. These workers may experience work related constraints due to the work environmental. Therefore, present study was planned on load carrying workers of grain market in the four cities of Haryana State. Study was conducted on 160 workers (40 from each city) to assess the constraints faced by the workers at grain market. Results show that occupational constraints was the highly faced constraints as it scored high WMS (8.51) and Rank I, second most faced constraints was behavioral constraints with WMS of 7.21 and injuries/MSD got rank III with WMS 6.96 due to the high temperature $35.4 + 2.27$ degree Celsius, high umidy $58.6 + 9.22\%$ and heat index $86.7 + 1.53$ from the recommended value. It is concluded that there was a need to some input which is helpful in maintaining the environmental parameters according to the workers' comfortable level.

Keywords: Constraints, environment, grain market, work and workers

Introduction

India's labour force consists of 466 million workers (2015-16); 4.75 million people are added to the labour force in India each year. Agriculture employs 233.1 million people, the majority of whom work as cultivators and labourers (Anonymous 2018a). Mandi labour, like agricultural labour in fields, plays an important and intensive role in agricultural regulated markets. Mandi labour is defined as labour that works in regulated agriculture markets or mandis during the mandi season, i.e. when crops arrive. The mandi labour performs a variety of tasks in a regulated agricultural market for various crop arrivals. In both the rabi and kharif seasons, various activities such as unloading, packing, cleaning, stitching, loading, and so on are carried out for various crops. Labor in mandi is only available during the marketing seasons of various crops, such as market arrivals of paddy and cotton in kharif and wheat crop in Rabi. The majority of agricultural operations are completed manually. Workers in agriculture are often divided into cultivators and labourers. Workers that handle grain engage in a variety of physically demanding tasks, including cleaning, collection, lifting, transporting, and loading. In many poor nations, carrying a load on the head is a widespread habit instead of carrying it on the back and shoulders. They have numerous health issues during these activities, including headaches, respiratory issues, itchy or irritated skin, and musculoskeletal disorders (MSDs). Work method rationalization can improve worker health and safety (Bhatt and Sharma, 2014) ^[2]. Grain handlers suffer from musculoskeletal disorders as a result of working in an awkward posture with heavy loads and repetitive work at various locations throughout the workplace. The primary job component of mandi workers is load handling, which entails lifting and carrying heavy loads of grain-filled sacs. Load carrying workers in grain markets work long hours, often starting early in the morning and working until late in the evening. They may work in all weather conditions, including extreme heat, cold, or rain. The work is physically demanding and can lead to injuries or health problems if appropriate safety measures are not in place. These workers may experience physical strain and fatigue as they carry heavy loads, which can contribute to occupational stress. It is a strenuous muscular activity that involves muscle flexion, resulting in both tangible and intangible injuries to workers' musculoskeletal systems.

So, the current study was planned to assess the working environment and constraints perceived by the different grain markets in load carrying activity in different areas.

Methodology

To achieve the planned objectives study was conducted on load carrying activity workers of grain market in two district of Haryana state. Hisar and Fatehabad district which were randomly selected. Four cities i.e. Hisar, Fatehabad, Ratia

and Hansi were also selected randomly. Sample was comprised of workers, who were involved in load carrying activity in the grain market. A total of 160 workers (40 from each city) were selected purposively who were physically fit and willing to cooperate in the study. A schedule was developed and tested on 30 respondents before conducting the actual study to collect the data. An observation sheet was prepared to assess the environmental parameters in the different grain markets. Measurements of different

Environmental parameters

Environmental variables	Measuring tools
Temperature	Thermometer
Heat stress	Heat index, NOAA (2001-02) (National Oceanic and Atmospheric Administration)
Humidity	Hygrometer
Suspended particulate matter	Air quality monitor

Personal interview schedule was used to collect the data and frequency, percentage, WMS and rank were calculated to analysis the data.

Results and Discussion

Table 1: Profile of workers in grain market (N=160)

Sr. No.	Variables	Hisar (n=40)	Hansi (n=40)	Fatehabad (n=40)	Ratia (n=40)	Total (N=160)
1.	Age					
	19-31 years	11 (27.5)	9 (22.5)	13 (32.5)	11 (27.5)	44 (27.5)
	32-44 years	20 (50.0)	22 (55.0)	16 (40.0)	22 (55.0)	80 (50.0)
	45-57 years	9 (22.5)	9 (22.5)	11 (27.5)	7 (17.5)	36 (22.5)
2.	Education					
	Illiterate	24 (60.0)	29 (72.5)	25 (62.5)	30 (75.0)	108 (67.5)
	Primary	11 (27.5)	11 (27.5)	13 (32.5)	9 (22.5)	44 (27.5)
	High	3 (7.50)	-	1 (2.50)	1 (2.50)	5 (3.10)
	10 + 2	2 (05.0)	-	1 (2.50)	-	3 (1.90)
3.	Total monthly family income					
	Rs.6,000-11,000	26 (65.0)	32 (80.0)	30 (75.0)	28 (70.0)	116 (72.5)
	Rs.12,000-17,000	11 (27.5)	5 (12.5)	4 (10.0)	7 (17.5)	27 (16.9)
	Rs.17,000-22,000	3 (07.5)	3 (07.5)	6 (15.0)	5 (12.5)	17 (10.6)

Profile of workers in grain market

Data in Table 1 indicate that half of workers (50.0%) in pooled sample belonged to 32-44 years of age group and physically fit. Similar trend was observed in all the four grain markets i.e. Hisar (50.0%), Hansi (55.0%), Fatehabad (40.0%) and Ratia (55.0%). More number of the workers

(67.5%) were illiterate in entire sample and similarly 60.0%, 72.5%, 62.5% and 75.0% from Hisar, Hansi, Fatehabad and Ratia respectively were illiterates. Majority of workers (80.0%) from Hansi. grain market followed by 75.0 percent from Fatehabad grain market, Ratia (70.0%) and Hisar grain market (65.0%) earned Rs.6 000-11,000.

Table 2: Constraints faced by workers in respect to work and workplace (N=160)

Sr. No.	Constraints	Hisar (WMS)	Hansi (WMS)	Fathebad (WMS)	Ratia (WMS)	Rank
A.	Work related constraints					
	Hard physical work	1.95	2.10	2.15	2.05	V
	Exertion due to over work	1.45	1.75	1.65	1.45	
	Lack of safety measures	1.45	1.35	1.42	1.32	
	AWMS	1.61	1.73	1.74	1.60	1.67
B.	Workers related constraints					
i	Personal problems					
	Lack of skill	1.25	1.45	1.6	1.37	VII
	Domestic violence	1.1	1.2	1.1	1.07	
	Lack of time for self	2.27	1.42	1.45	2.3	
	AWMS	1.54	1.35	1.38	1.58	1.46
ii	Physical problems					
	Back-ache due to prolong working	2.12	2.25	1.77	2.42	IV
	Breathing problem	1.27	1.70	1.50	1.40	
	Allergy	1.27	1.32	1.52	1.65	
	Joint pain	1.9	2.37	2.02	2.1	

	Skin problem	1.22	1.35	1.42	1.7	
	AWMS	1.55	1.79	1.64	1.85	1.70
iii	Psychological constraints					
	Boredom fatigue	1.07	1.85	1.62	1.67	VI
	Sleep disturbance	2.25	1.72	1.42	1.55	
	Irritability and intolerance	1.4	1.47	1.65	1.55	
	AWMS	1.57	1.68	1.56	1.59	1.60
iv	Injuries/MSD					
	Problem in bending/straightening	2.60	2.65	2.35	2.05	III
	Swelling	1.35	1.45	1.65	1.37	
	Cut	1.27	1.47	1.45	1.2	
	Fracture	1.65	1.52	1.65	2.02	
	Wound	1.72	1.7	1.97	1.82	
	AWMS	1.71	1.75	1.81	1.69	1.74
v.	Occupational problems					
	Delay in payment of wages	2.45	2.27	2.47	2.45	I
	Deduction in wages	1.67	1.75	1.77	2.05	
	Low wages	2.07	2.4	2.52	2.1	
	Lack of incentive	1.72	1.9	1.65	2.05	
	Long working hours with limited payment	2.5	2.5	2.4	2.45	
	Threats of dismissal	1.95	2.12	2.27	1.62	
	AWMS	2.06	2.15	2.18	2.12	2.13
C.	Workplace related					
i.	Behavioral factor					
	Rude behavior of contractor	1.85	1.95	1.80	1.77	II
	Rude behavior of co-worker	1.32	2.2	2.12	1.65	
	Abusive language	1.75	1.87	1.72	1.65	
	AWMS	1.64	2.00	1.88	1.69	1.80
ii	Environment factors					
	Skin burn	1.2	1.47	1.45	1.42	IV
	Eye strain	1.4	1.4	1.37	1.4	
	Vomiting	1.32	1.4	2.02	2.02	
	Headache	1.92	1.35	2.15	1.45	
	Dirt/dust	2.25	1.72	1.47	1.57	
	Temperature	2.32	1.85	2.05	2.1	
	Light	1.22	2.17	1.55	2.22	
	Humidity	2.17	1.9	1.57	1.85	
	AWMS	1.72	1.65	1.70	1.75	1.70

Constraints faced by workers in respect to work and workplace

Different constraints faced by workers in respect to work and workplace while performing the load carrying activity has been presented in Table 2. Results show that work related constraints were more prominent in Fatehabad city as it scored highest (1.74) followed by Hansi (1.73) and Hisar (1.61). Work related constraints included personal problems, physical problem, psychological problems injuries/MSD and occupational problems. Personal problems were more prominent among the workers from Ratia as it scored (1.58) and Hisar (1.54). In physical problems, back-ache due to prolong working was the most severe problem in grain markets of all the cities followed by joint pain. Overall, workers in Ratia grain market faced the more constraints with WMS of 1.85 followed by Hansi (WMS 1.79). In psychological constraints, sleep disturbance was the main constrain faced by Hisar grain market workers

(2.25), boredom fatigue in Hansi and Ratia workers (1.85 & 1.67 respectively), irritability and intolerance among the Fatehabad grain market workers. Problem in bending/straightening was the main constraints faced by most of the workers among all city grain markets. In occupational problems, delay in payment of wages was the most common problem among all workers. Occupation problems were the most prominent among the workers of Fatehabad city (2.18) followed by Hansi workers (2.15) and Hisar (2.06). Work related constraints included behavioral factor and environment factors. In behavioral factors, Rude behavior of contractor was the most commonly faced problem in all the grain markets i.e. Hansi (1.95), Hisar (1.85), Fatehabad (1.80) and Ratia (1.77). In environmental factors, workers from the Ratia grain market were faced the more problems (1.75), followed by Hisar (1.72) and Fatehabad (1.70).

Table 3: Environmental parameters of grain markets (N=4)

Environmental parameters	Working condition (Mean + SD)				Total (Average)	% difference	Recommended value*
	Hisar	Hansi	Fatehabad	Ratia			
Temperature (°C)	35.2 + 2.5	35.8 + 2.0	34.8 + 2.3	35.9 + 2.3	35.4 + 2.27	53.9%	20-24 (°C)
Humidity (%)	59.3 + 8.5	59.0 + 8.9	60.7 + 10.1	55.5 + 9.4	58.6 + 9.22	17.2%	40-60%
Heat stress (°F)	81.6 + 1.6	83.8 + 1.42	89.9 + 1.57	91.5 + 1.62	86.7 + 1.53	2.0%	80°F-90°F
Suspended particulate matter (um)	74.2 + 11.9	72.0 + 14.3	69.9 + 14.5	77.1 + 13.6	73.3 + 13.5	47.6%	140ug/m ³

Environmental parameters of grain markets

A compatible work environment is very important to perform the task easily and to increase the productivity with reduced numbers of errors. Hence, the grain market environment was assessed with environmental parameters which include temperature, relative humidity, heat stress, and SPM (suspended particulate matters. Table revealed the data regarding the environmental parameters of grain market in summer season.

Data revealed that recommended value of the temperature was 20-24 °C. Mean temperature in the Hisar grain market was 35.2 °C, 35.8 °C in Hansi grain market, 34.8 °C in Fatehabad grain market and 35.9 °C in Ratia grain market with 53.9 percent different to the recommended value. Recommended value of the relative humidity is (40-60%).

Table 3 further revealed that mean relative humidity in the Hisar grain market was 59.3 percent, 59.0 percent in Hansi grain market, 60.7 percent in Fatehabad grain market and 55.5 percent in Ratia grain market with 17.2 percent difference. Heat stress faced by workers in grain market was assessed and found that heat stress score in grain market of Hisar was 81.6 °F, 83.8 °F in Hansi, 89.9°F in Fatehabad and 91.5 °F in Ratia with 2.0 percent difference to the recommended value i.e. 80 °F - 90 °F. Results further revealed that suspended particulate matter was highest in Ratia grain market (77.1ug/m³) followed by Hisar grain market (74.2 ug/m³), Hansi grain market (72.0 ug/m³) and Fatehabad grain market (69.9ug/m³) with 47.6 percent differ from recommended value of SPM is 140ug/m³.

Table 4: Levels of problems faced by workers in load carrying activity of grain market

Sr. No.	Variables	Hisar (n=40)	Hansi (n=40)	Fatehabad (n=40)	Ratia (n=40)	Total N=160
1.	Feeling of exhaustion after load carrying activity	32 (80.0)	28 (70.0)	34 (85.0)	24 (60.0)	118 (73.7)
2.	Feeling of discomfort in body part while doing activity	30 (75.0)	27 (67.5)	33 (82.5)	31 (77.5)	121 (75.6)
3.	Problems in body parts	(n=30)	(n=27)	(n=33)	(n=31)	(n=121)
	Neck	6 (20.0)	3 (11.1)	7 (21.2)	10 (32.2)	26 (21.5)
	Shoulders	11 (36.7)	6 (22.2)	9 (27.3)	4 (12.9)	30 (24.8)
	Upper back	3 (10.0)	2 (7.41)	1 (3.03)	3 (9.67)	9 (7.43)
	Mid back	5 (16.7)	4 (14.8)	2 (6.06)	6 (19.4)	17 (14.0)
	Lower arms	1 (3.33)	2 (7.41)	2 (6.06)	1 (3.23)	6 (4.95)
	Lower back	2 (6.67)	8 (29.6)	5 (15.2)	2 (6.46)	17 (14.0)
	Thighs	1 (3.33)	1 (3.70)	2 (6.06)	1 (3.23)	5 (4.13)
4.	Legs	1 (3.33)	1 (3.70)	5 (15.2)	4 (12.9)	11 (9.09)
	Nature of Problem					
	Temporary	25 (83.3)	17 (63.0)	27v (81.8)	29 (93.5)	98 (80.9)
5.	Permanent	5 (16.7)	10 (37.0)	6 (18.2)	2 (6.45)	23 (19.1)
	Recover time from pain	(n=25)	(n=17)	(n=27)	(n=29)	(n=98)
	<5 min.	6 (24.0)	3 (17.6)	1 (3.70)	9 (31.0)	19 (19.4)
	5-15 min.	11 (44.0)	2 (11.8)	10 (37.0)	16 (55.1)	39 (39.8)
	>15 min.	8 (32.0)	12 (70.5)	16 (59.2)	4 (13.8)	40 (40.8)

Levels of problems faced by workers in load carrying activity of grain market

Levels of problems faced by workers in load carrying activity of grain market have been presented in Table 4. Majority of workers in composite sample (73.7%) and 85.0 percent, 80.0 percent, 70.0 percent and 60.0 percent respectively in grain market of Fatehabad, Hisar, Hansi and Ratia felt exhausted after the activity.

Table further highlighted that 75.6 percent workers in aggregate and 82.5 percent, 77.5 percent, 75.0 percent & 67.5 percent respectively in Fatehabad, Ratia, Hisar & Hansi felt discomfort in various body part.

Data represent that maximum discomfort was in shoulder region of 24.8 percent of workers in composite sample and 36.7 percent, 27.3 percent, 22.2 percent & 12.9 percent respectively in workers of Hisar, Fatehabad, Hansi and Ratia followed by discomfort in neck (21.5% 32.2%, 21.2%, 20.0% & 11.1% respectively in total sample and workers from Ratia, Fatehabad, Hisar and Hansi), mid back (14.0%, 16.7%, 14.8%, 6.06% & 19.4% respectively in totality and workers from Hisar, Hansi, Fatehabad and Ratia) lower back (14.0%, 6.67%, 29.6%, 15.2% & 6.46% respectively in totality and workers from Hisar, Hansi, Fatehabad and Ratia) legs (9.09%, 3.33%, 3.70%, 15.2% & 12.9% respectively in totality and workers from Hisar, Hansi, Fatehabad and Ratia), upper back (7.43%, 10.0%, 7.41%, 3.03% & 9.67% respectively in totality and workers from Hisar, Hansi, Fatehabad and Ratia) and lower arms was in

4.95%, 3.33%, 7.41%, 6.06% & 3.23% respectively in totality and workers from Hisar, Hansi, Fatehabad and Ratia). Majority of the respondents 80.9 percent, 83.3 percent, 63.0 percent, 81.8 percent & 93.5 percent respectively in composite sample, Hisar, Hansi, Fatehabad and Ratia felt discomfort due to carrying load activity that was temporary. Table further displays the averages recovery time from body pain due to load carrying activity. The total sample revealed that 40.8 percent workers recovered from pains in more than 15 minute, 39.8 percent respondents in 5-15 minute followed by 19.4 percent respondents in less than 5 minute.

Conclusion

It is concluded that overall occupational problems of workers got Ist rank with 2.13 WMS, behavioral factor got rank IInd (WMS 1.80), injuries/MSD got rank IIIrd (WMS 1.74), physical problems and environmental factor IVth rank each (WMS 1.70), work related constraints got Vth rank and least problems was personal problems rank VIIth. It is also concluded that environmental parameters i.e. temperature, humidity and heat stress were not as per the recommendation and were creating the health issues among the grain workers. Majority of the respondents (75.6%) felt the discomfort in body part while doing activity. Among them 24.8 percent respondents faced the shoulder [pain followed by neck pain (21.5%). Most of the respondents faced temporary pain and take more than 15 minutes to recover.

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