

Occupational Health Hazards of Agricultural Laborers

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ABSTRACT Cereals are cultivated primarily for their starchy seeds and are staple food crops in India. Common cereals produced in India are wheat, rice, maize, oats, barley, sorghum and some of the millets. India has world's largest number of agriculture workers as more than sixty per cent of population is engaged in agriculture. Most of the farmers have small land holdings because many activities are performed manually viz., sowing, weeding, fertilizer application, pesticide spraying, harvesting, threshing, cleaning, storage etc. The study revealed that during harvesting time, the stalks of cereal crops dry completely and become hard, therefore the farm workers faced difficulty in harvesting such crops and causes cut in hands/arms. Since sorghum grains contain husk, which was accumulated on the body during threshing and causes itching/irritation in hands and other parts of the body. These problems may occur due to the non usage of any kind of functional clothing at work place. Hence, there is a need to design operation specific functional clothing for labourers. Findings suggest for designing hand gloves - harvesting and apron, head gear, mask-threshing.

INTRODUCTION

Cereals or grains are members of the grass family cultivated primarily for their starchy seeds. Common cereals produced in India are wheat, rice, maize, oats, barley, sorghum and some of the millets. Agriculture with its allied sectors is undeniably the largest livelihood provider in India more so in the vast rural areas.

India has world's largest number of agriculture workers as more than sixty per cent of population is engaged in agriculture. Most of the farmers have small land holdings as a result activities like sowing, weeding, fertilizer application, pesticide spraying, harvesting, threshing, cleaning, storage are performed manually. In harvesting season, farmers are exposed to high levels of organic dust during threshing of crops leading to many health hazards (Gandhi et al. 2012). Grain dust inhalation may induce respiratory diseases including chronic bronchitis, granulomatous pneumonitis and toxic pneumonitis which finally may lead to decreased lung function.

Farm workers perform strenuous tasks and are exposed to a wide range of occupational risks and hazards. Low socio – economic status and poor access to health care also contribute to existing health problems in this population (Mobed et al. 1992). The present study was carried out to study the occupational health prob-

lems among the farm workers of cereal crops and to study the existing clothing practices.

MATERIAL AND METHODS

Locale and Sample Selection

The survey was carried out in Yettingudda, Narenda and Hebballi villages of Dharwad district. Totally 90 respondents (30 each crop) were interviewed to elicit the information on health problems among farm workers.

Tools Used

Self structured questionnaire was used for eliciting information regarding demographics of respondent, type of activity performed, health problems encountered during work and occupational dress pattern of farm workers. Information was collected by personal interview method.

RESULTS

The demographics of the respondents is presented in Table 1. Fifty- three per cent of maize workers belonged to age group below thirty years and in wheat and sorghum forty and thirty- six per cent of workers fell under the age group of 31- 41years. The majority of workers engaged in maize and sorghum (46.6% and 40%)

Table 1: Demographic characteristics of cereal crop farm workers (N= 90)

S.No.	Details	Maize (n=30)		Wheat (n=30)		Sorghum (n=30)	
		No.	%	No.	%	No.	%
<i>Age</i>							
1	Below 30 yrs	16	53.3	9	30.0	10	33.3
2	31-41yrs	4	13.3	12	40.0	11	36.6
3	Above 42 yrs	10	33.3	9	30.0	9	30.0
<i>Academic Standard</i>							
1	Illiterate	14	46.6	11	36.6	12	40.0
2	Primary education	9	30.0	4	13.3	5	16.6
3	Secondary education	2	6.6	12	40.0	9	30.0
4	Intermediate	5	16.6	3	10.0	4	13.3
5	Graduation andabove	-	-	-	-	-	-
<i>Type of Family</i>							
1	Nuclear	20	66.6	25	83.3	23	76.6
2	joint	10	33.3	5	16.6	7	23.3
<i>Land Holding</i>							
1	Marginal	3	10.0	4	13.3	6	20.0
2	Small	20	66.6	18	60.0	19	63.3
3	Medium	7	23.3	8	26.6	5	16.6
4	Large	-	-	-	-	-	-

were illiterate, whereas wheat (40%) workers completed their education up to secondary education. Further, it is observed from the table that maximum per cent (66.6%, 83.3% and 76.6%) of respondents among maize, wheat and sorghum crops belonged to nuclear family system and were small farmers (66.6%, 60% and 63.3%) respectively.

It is observed from Table 2 that, greater percent of male workers engaged in maize, wheat and sorghum crops performed farm activities like sowing, weeding and harvesting (16.6% and 50% each), land preparation (16.6%, 36.6% and 33.3%) and seed treatment (16.6%, 3.3% and 10%) respectively. Cleaning of grains (43.3% and 40%) was performed by males; only in wheat and sorghum crops. storage (16.6% and 33.3% each) of

cereals crops and drying (16.6%, 33.3% and 30%) was also performed by male workers respectively. Whereas harvesting and cleaning (83.3% and 50% each) and weeding (46.6% and 50% each) were the activities performed by female workers respectively.

The technique used for performing farm activities is represented in Table 3. Farm activities like, sowing (100%) fertilizer application (73.3%) and seed treatment (13.3%) were performed manually. Cent, per cent of workers carried out weeding and harvesting manually using agricultural equipment like *kurpi*, a smaller version of sickle used for weeding operations and sickle. Besides, cleaning (100%) land preparation (56.6%) and threshing were performed by using agricultural equipments like tractor and machine respectively in maize field.

Table 2: Types of activities performed by farm workers (N=90)

S. No.	Activities performed	Maize(n=30)				Wheat(n=30)				Sorghum(n=30)			
		Male		Female		Male		Female		Male		Female	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1	Seed treatment	5	16.6	-	-	1	3.3	1	3.33	3	10	-	-
2	Land preparation	5	16.6	-	-	11	36.6	-	-	10	33.3	-	-
3	Sowing	5	16.6	14	46.6	15	50.0	15	50.0	15	50	15	50
4	Weeding	5	16.6	25	83.3	15	50.0	15	50.0	15	50	15	50
5	Harvesting	5	16.6	25	83.3	15	50.0	15	50.0	15	50	15	50
6	Cleaning	-	-	-	-	13	43.3	15	50.0	12	40	15	50
7	Drying	5	16.6	-	-	10	33.3	-	-	9	30	-	-
8	Storage	5	16.6	-	-	10	33.3	-	-	10	33.3	-	-

Table 3: Techniques used for performing farm activities (N=90)

S. No.	Activities performed	Maize(n=30)				Wheat(n=30)				Sorghum(n=30)			
		Manual		Machine		Manual		Machine		Manual		Machine	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1	Seed treatment	4	13.3	-	-	2	6.6	-	-	14	46.6	-	-
2	Land preparation	11	36.6	17 (tractor)	56.6	10	33.3 (tractor)	5	16.6	10 (tractor)	36.6	5	16.6
3	Sowing	30	100	-	-	30	100	-	-	30	100	-	-
4	Irrigation	-	-	18	60.0	-	-	13	43.3	-	-	-	-
	Drip	-	-	3	10.0	-	-	17	56.6	-	-	-	-
	Canal	-	-	5	16.6	-	-	-	-	-	-	11	36.6
	Pipe	-	-	5	16.6	-	-	-	-	-	-	-	-
5	Fertilizer application	22	73.3	5 (pump)	16.6	30	100	-	-	30	100	-	-
5	Weeding	30 (kurupi)	-	100	-	-	30 (kurupi)	100	-	-	30 (kurupi)	100	-
6	Harvesting	30 (sickle)	-	100	-	-	30 (sickle)	100	-	-	30 (sickle)	100	-
7	Threshing	-	-	30 (machine)	100	30 (wooden beater)	100	-	-	5 (wooden beater)	16.6	25	83.3
8	Cleaning	-	-	30 (machine)	100	23 (cleaning pan)	76.6	-	-	21 (cleaning pan)	70.0	9	30.0

Table 4: General problems encountered during farming (N=90)

S. No.	Problems encountered	Land preparation			Irrigation			Weeding			Application of fertilizer		
		Maize (n=30)	Wheat (n=30)	Sorghum (n=30)	Maize (n=30)	Wheat (n=30)	Sorghum (n=30)	Maize (n=30)	Wheat (n=30)	Sorghum (n=30)	Maize (n=30)	Wheat (n=30)	Sorghum (n=30)
1	Soiling of Hair	2 (6.6)	14 (16.6)	13 (43.3)	-	-	-	-	-	-	-	-	-
	Face	1 (3.3)	12 (40)	15 (50)	-	-	-	-	-	-	-	-	-
	Feet	2 (6.6)	9 (30)	11 (36.6)	-	14 (16.6)	11 (36.6)	28 (93.3)	30 (100)	30 (100)	2 (6.6)	25 (83.3)	24 (80)
2	Skin Allergy	-	-	-	-	-	-	-	-	-	-	-	-
	Face	-	-	-	-	-	-	4 (13.3%)	6 (20%)	10 (36.6%)	3 (10%)	-	-
	Hand	-	-	-	-	-	-	-	-	-	-	-	-
3	Feet	-	-	-	-	-	-	15 (50)	17 (56.6)	20 (66.6)	2 (6.6)	24 (80)	15 (50)
	Headache	-	2 (6.6)	-	-	10 (33.3)	-	-	-	-	-	-	-
4	Sweating	-	14 (16.6)	14 (16.6)	-	-	-	16 (53.3)	29 (96.6)	25 (83.3)	2 (6.6)	27 (90)	16 (53.3)
	Sweating	-	-	-	-	-	-	-	-	-	-	-	-

Figures in parenthesis indicate percentages

In wheat field majority of farm activities like sowing and fertilizer application (100%), land preparation (33.3%) and seed treatment (6.6%) were performed manually. *Kurupi*, sickle, wooden beater and cleaning pan were the agricultural equipments used for performing weeding, harvesting, threshing and cleaning of grains (100%) respectively.

Further, it is observed from table that agricultural activities like sowing and fertilizer application (100 %), seed treatment (46.6%) and land preparation (36.6%) were performed manually in sorghum field. Field operation like weeding and harvesting (100%), and cleaning (70%) were also performed manually using agricultural equipment like *kurupi*, sickle and cleaning pan.

The general problems encountered during farm activities are depicted in Table 4. Sweating (16.6% each) and soiling of face (3.3%, 40% and 50%), feet (6.6%, 30% and 36.6%) and hair (6.6%, 16.6% and 43.3%) were the problems faced by maize, wheat and sorghum farm workers during land preparation respectively.

Headache (33.3%) and soiling of feet (16.6% and 36.6%) were the problems encountered during irrigation in wheat and sorghum field. While performing farm activity like weeding the problems encountered were soiling of feet (93.3% and 100% each), sweating (53.3%, 96.6% and 83.3%), headache (50%, 56.6% and 66.6%) and

skin allergy of hand (13.3%, 20% and 36.6%), in maize, wheat and sorghum fields respectively.

During fertilizer application in maize, wheat and sorghum fields farm workers faced the problems like skin allergy of hand (10%), sweating (6.6%, 90% and 53.3%) soiling of feet (6.6%, 83.3% and 80%) and headache (6.6%, 80% and 50%) respectively.

It is noticed from Table 5 that, farm workers of cereal crops faced specific problems during sowing were backache (76.6%, 66.6% and 73.3%) and shoulder ache (33.3% and 66.6%) due to bending and holding container respectively. While harvesting, the workers had problems like cuts in hands/arms (83.3% and 100% each) in maize, wheat and sorghum field respectively. Further, it is observed from table that, during threshing, the workers of wheat and sorghum faced health problems like cuts in hands/arms (100% and 16.6%) respectively. Sorghum workers had itching/irritation in hands and other body parts (16.6%).

Data in Table 6 shows that, male workers did not wear any kind of protective clothes while performing field activities in cereal crops field. They used towel (80% each and 100%) for covering head and wore *chappal*, as footwear (100 % each) for feet respectively.

Majority of female farm workers of maize, wheat and sorghum fields did not wear any kind

Table 5: Specific problems encountered during farming (N=90)

S.No.	Problems encountered	Maize (n=30)		Wheat (n=30)		Sorghum (n=30)	
		No.	%	No.	%	No.	%
1	<i>Sowing</i>						
	Backache due to bending	23	76.6	20	66.6	22	73.3
	Shoulder ache due to holding	-	-	10	33.3	20	66.6
2	<i>Harvesting</i>						
	Cuts in hands/arms	25	83.3	30	100	30	100
3	<i>Threshing</i>						
	Cuts in hands/arms	-	-	30	100	5	16.6
	Itching/irritation in hands and other body parts	-	-	-	-	5	16.6

Table 6: Occupational dress pattern of male (N=35)

S.No.	Dress pattern	Maize(n=05)		Wheat(n=15)		Sorghum(n=15)	
		No.	%	No.	%	No.	%
1	<i>Head</i>						
	Towel	04	80	12	80	15	100
2	<i>Feet</i>						
	Chappal	05	100	15	100	15	100

of functional clothes during field activities (Table 7). They wore shirt as over garment (100% each), wrapped old sari piece around waist (100%, 60% and 66.6%). In addition, to that they use scarf (24%) in maize and towel (36% and 46.6%) in maize and wheat to cover face and cent percent workers *chappal* for feet respectively.

DISCUSSION

Respondents' demographics were represented in Table 1. Greater percent of agriculture workers were below 30 yrs of age group and majority of them were illiterate. Further, it was observed from demographics that highest numbers of respondents belonged to nuclear family and were small farmers.

It was revealed from Table 2 that majority of male workers of maize, wheat and sorghum performed farm activities such as land preparation, seed treatment, sowing, fertilizer application and storage of grains which required physical strength. Whereas weeding, harvesting and cleaning of grains were the activities carried out by female workers, since farm women have the skills and efficiency in above mentioned activities.

It was evident from Table 3 that agricultural operations for instance sowing, seed treatment and fertilizer application were performed manually by majority of maize, wheat and sorghum crops agricultural labourers. Majority of farm workers use agriculture equipments such as *kurpi*, sickle and cleaning pan for weeding, harvesting, threshing and cleaning activities. Having the reason that most of farmers belonged to low socio – economic status and have small land holdings, consequently they carried out above mentioned activities manually. Besides, maize

field workers used tractor for land preparation and thresher for threshing maize.

A glance at Table 4 indicates that sweating, soiling of face, feet and hair were the general problems faced by cereal crop agricultural laborers while land preparation. During weeding and fertilizer application activities, soiling of feet, sweating, headache, and skin allergy in hand were the problems encountered by the labourers. The chemicals present in fertilizer caused skin allergy in hands.

In a study on "Occupational health hazards of faced by the dal mill workers" by Sudha et al. (2014) found that skin allergy was the major problem faced by the dal mill workers during dehusking, cleaning, sieving, drying, packaging, loading and unloading. Burning sensation of skin, eye irritation and itching were also faced by the dal mill workers attributed to strong sunlight and heat produced by machines.

Cereal crop farm workers faced specific problems as presented in Table 5. Backache, shoulder ache due to bending and holding container were the health hazards faced by the labourers while sowing operation. During harvesting maize, wheat and sorghum, the farm workers had encountered problems such as cuts in hand/arm. During harvesting time, the stalks of cereal crops dry completely and become hard; workers faced difficulty in harvesting such crops. Similarly while threshing sorghum and wheat, the workers had cuts in hands/arms, itching /irritation in hands and other parts of body. It may due to sorghum grains contain husk, which accumulate on the body during threshing and causes skin disorders.

In a study on "Occupational related health problems of workers in ginning mill" by Jyoti et al. (2013) noticed that accumulation of cotton dust on clothes and body was common problem

Table 7: Occupational dress pattern of female (N=55)

S.No.	Dress pattern	Maize (n=25)		Wheat (n=15)		Sorghum (n=15)	
		No.	%	No.	%	No.	%
1	Upper garment						
	Shirt (as over garment)	25	100	15	100	15	100
2	Lower garment						
	Old saree (wrap around waist)	25	100	9	60	10	66.6
3	Face						
	Scarf	6	24	-	-	-	-
	Towel	9	36	7	46.6	-	-
4	Feet	25	100	15	100	15	100
	<i>Chappal</i>						

in ginning mill. The dust particles along with the minute fibers detached from cotton seed and get accumulated on the body. In addition, eye irritation, watery eyes, sneezing, running nose and breathing problems were the major occupational health problems faced by ginning mill workers. Inhaling of the particles unknowingly was the main factor responsible for causing the above mentioned health problems.

The study on "Protective clothing for male farm workers engaged in wheat threshing" by Punam et al. (2014) reported that agriculture workers face many occupational health problems while threshing wheat. Common health problems encountered were dust stick on their body, eye irritation/itching, headache, skin irritation/itching, skin allergy/ailment, sneezing and bronchitis.

It is observed from Table 6, that male workers did not wear any kind of protective clothes while performing agricultural operations. They use towel for covering head and wore *chappal* for feet. Similar sort of results were found in Table 7 that the female workers wore old shirt as over garment, wrapped old sari piece around waist and wore *chappal* for feet.

In a study on "Occupational health hazards faced by the dal mill workers" by Sudha et al. (2014) found that most of the dal mill men workers wear *kurta*, *pajama/dhoti* and *chappals* in feet. Female workers wear blouse, *odhini ghagara* and *chappal*.

CONCLUSION

The study concluded that most of the farmers have small land holdings because of that many activities viz., sowing, weeding, fertilizer application, pesticide spraying, harvesting, threshing, cleaning, storage etc are performed manually. During harvesting time, the stalks of cereal crops dry completely and become hard, therefore the farm workers faced difficulty in harvesting such crops leading to cuts in hands/arms. Since sorghum grains contain husk, which was accumulated on the body during threshing and causes itching/irritation in hands and other parts of the body. These problems may occur due to the non usage of any kind of functional clothing at work place. Hence, there is a need to design operation specific functional clothing for

labourers. Findings suggest for designing hand gloves - harvesting and apron, head gear, mask - threshing.

RECOMMENDATIONS

Occupation related health problems necessarily impose long term effects on health that could be curbed up to some extent through the use of appropriate clothing. In fact, designing functional clothing for various occupations, modification, and creation of new fibers and fabrics with advanced performance like filtration, UV protection, etc are the need of the hour. Coating on the fabrics for functional end users to make clothing and related gadgets available at reasonable prices is essential.

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