

OCCUPATIONAL HEALTH HAZARDS FACED BY THE FLOUR MILL WORKERS

Sudha Babel* and Rupali Rajvanshi**

ABSTRACT

The workplace environment affects the health of workers. Unhygienic conditions are observed in the workplace environment of flour mills as fine organic flour dust gets airborne in the indoor environment of the flour mills. The present work was undertaken to study the health problems faced by flour mill workers and to find out existing clothing practices and the use of personal protective clothing by flour mill workers. The result reveals that grinding was carried out by all the units. Major problem faced by flour mill workers were related to grinding followed by loading and unloading. Grain cleaning was done by only 60 per cent units. It was further revealed that none of the flour mill workers was using the personnel protective devices while working. We recommend the compulsory use of personal protective equipment (nose mask) by flour mill workers during working hours

INTRODUCTION

Flour milling can trace its origins back to pre-history, but the modern systems known as gradual reduction flour mills have only been developed over the last 200–300 years. Grain handling facilities, as defined by the Occupational Health and Safety Administration (OHSA) Grain Handling Standard, include: grain elevators, feed mills, flour mills, rice mills, dust pelletizing plants, dry corn mills, soybean flaking operations, and the dry grinding operations of soy cake. Flour is also considered to be a substance hazardous to health by the Health and Safety Executive (HSE). In their Control of Substances Hazardous to Health (COSHH) Regulations 1994, flour is defined as the finely ground particles of cereals or pulses (including such contaminants as mites, weevils, or fungal antigens) that result from any grinding process and from any subsequent handling and use of that “flour.” The American Conference of Governmental Industrial Hygienists (ACGIH) defines flour as a complex organic dust consisting of wheat, rye, millet, barley, oats or corn cereal, or a combination of these, which have been processed or ground by milling. In 1999 the American Conference of Governmental Industrial Hygienists (ACGIH) proposed a Threshold Limit Value (TLV) of 0.5 mg/m³ for flour dust with a sensitization notation (*Kakooei and Marioryad, 2005*).

Flour dust is a hazardous substance; it is a respiratory sensitizer and is known to cause allergic rhinitis and occupational asthma. It is also an irritant and may give rise to short term respiratory, nasal and eye symptoms. It may provoke an asthmatic attack in individuals with pre-existing disease and lead to chronic bronchitis (*Ajeel and Al-Yasin, 2007*)

Inhalation of flour dust can produce allergic reaction and chronic respiratory disorders, including sensitization and asthma. Epidemiological studies focusing on exposure-response relationships, as well as personal exposure to inhalable flour dust, wheat, and α -amylase allergens in flour mills and bakeries have been analyzed by several authors. In some Canadian provinces, flour dust with the exposure limit of 10 mg/m³ total dust, and 5mg/m³ for repairable dust, respectively has been established. The Health and Safety Commission of the United Kingdom has established an 8-h maximum exposure limit of 10 mg/m³ for flour dust, with a 15-min exposure limit of 30 mg/m³. Flour dust is a hazardous substance with respiratory sensitizing with pre-existing disease and also causes chronic bronchitis (*Smith and Lumley, 1996*). Due to all these reasons & the present investigation was planned with the objective to study the general profile of the respondents, to find out the problems faced by the flour mill workers and to find out existing clothing practices

* Principle Investigator, Dept. of Textiles & Apparel Designing, College of Home Science, MPUAT, Udaipur .

** Research Scholar, Dept. of Textiles & Apparel Designing, College of Home Science, MPUAT, Udaipur .

and use of personnel protective devices by the flour mill workers.

RESEARCH METHODOLOGY

The present study was conducted in urban area of Udaipur city. Thirty flour mills were purposively selected for the present study. These flour mill owners were working at flour mill from last ten years. A

questionnaire was used to generate information on self-reported problems. Critical examination of work place was also done to know about the work environment. Data were analyzed using frequency, percentage and weighted mean scores.

RESULTS AND DISCUSSION

General profile of the flour mill workers

Table 1: General profile of the respondents

n=30

S. No.	Aspects	Categories	f	%
1	Age (in years)	31-40	12	40.0
		41 -50	18	60.0
2	Caste	SC/ST	06	20.0
		Backward OBC)	12	40.0
		General	12	40.0
3	Family Type	Nuclear	24	80.0
		Joint	6	20.0
	Family Size	Small (up to 4 members)	12	40.0
		Medium (5-8 members)	18	60.0
4	Education	up to Primary	6	20.0
		up to Middle	6	20.0
		up to metric	12	40.0
		Higher secondary	6	20.0
5	Monthly Income (Rs.)	up to 5000	5	6.67
		5000-10000	18	60.0
		10000-20000	7	23.33
6	Marital Status	Married	29	26.67
		Widower	01	3.33
7	Family occupation	Flour Mill	18	60.0
		Agriculture	6	20.0
		Services	6	
		10-20 years	18	60.0
10	Duration (hrs/day)	< 20 years	12	40.0
		8-10hours	12	40.0
11	Past history of illness	6-8 hours	18	60.0
		Yes	5	16.67
12	Bad Habit (smoking ...)	No	25	83.33
		Yes	5	16.67
		No	25	83.33

The data in the table show that 60 per cent of respondents were in the age group of 40 and above, 40 per cent were between the age group of 30-40 years and none of the respondents belong to 20-30 years age group. The caste wise distribution of the respondents highlight that 40 per cent respondents were from other backward caste and general category. Only 20 per cent respondents belonged to ST/SC category. Eighty per cent respondents belonged to nuclear family and remaining were from joint family. Further, 60 per cent of respondents had medium family size, 40 per cent of respondents had small family and none of the respondents had large family. The data in the table bring to light that 40 per cent of respondents were metric pass, 20 per cent each had primary, up to middle and higher secondary education. Table further depicts that 60 per cent of the respondents were in the income range of Rs. 5000-10000 per month 6.67 per cent earned up to Rs. 5000 per month. 23.33 percent were in the income range of Rs.10,000-20,000 per month.

Regarding the marital status of the respondents, it can be reviewed from the table that vast majority of the respondents (96.67%) were married, whereas 3.33 per cent was widower. The occupational profile of the respondents reveals that good per cent

of the respondents (60%) had flour mill as their family occupation and equal number of respondents (20 per cent) were involved in agriculture and doing service along with flour mill. Good number of the workers (60%) had work experience of more than ten years. While 40 per cent respondents had more than 20 years. Sixty per cent were operating flour mill for 6-8 hour while 40 percent for 8-10 hours .

Review of the able further reveals that none of the respondents had any disease from childhood period. However, the researcher was curious about their past illness based on their habits of smoking, drinking and tobacco chewing. it was found that only 16.67 per cent respondents belongs to this category.

Table 2: Activities carried out in different flour mills
n-30

S.no.	Type of activity	Frequency	Percentage
1	Cleaning	18	60.0
2	Grinding	30	100
3	Packing	30	100
4	Loading	30	100
5	Unloading	30	100

Table 3: Problems encountered by flour mill workers

n-30

Problems encountered		Activities				
		Cleaning f (%)	Grinding f (%)	Packing f (%)	Loading f (%)	Unloading f (%)
Skin allergy	Face	3 (10%)	12 (40%)	-	-	-
	Hand	9 (30%)	-	-	-	-
	Feet	7 (23.33%)	-	-	-	-
Eye irritation and itching		6 (20%)	18 (60%)	-	-	-
Back Ache		-	-	03 (60%)	18 (60%)	12 (40%)
Shoulder ache					18 (60%)	14 (46.67%)
Breathlessness		-	18 (60%)	-	-	-
Allergic Bronchitis		-	12 (40%)	-	-	-
Nausea		-	6 (20%)	-	-	-
Headache		-	18 (60%)	-	-	-
Sweating		-	24 (80%)	-	-	-
Cut in hand		-	-	-	-	-
Coughing and sneezing		-	25 (83.33%)	-	-	-

Type of activity carried out at unit

Table 2 clearly shows that cleaning was the activity carried out by only 60 per cent of the unit, while all the other activities were carried out by all the units.

Problems encountered while working in flour mill

The workers working in flour milling are exposed to many hazards, and the major hazards were related to grinding activity which may be due to exposure to flour dust. Grain cleaning activity was carried out by only 60 per cent of the respondents as there flour mill owners were also involved in selling of the flour while rest were only grinding the grains i.e. wheat, maize and Bengal gram dal. Problems encountered while grain cleaning were mainly related to skin allergies (face, hand and feet) and it ranged from 10-23.33 per cent.

The table clearly shows that 83.33 per cent respondents suffered from sneezing and cough which lead to acute effects related to the respiratory problems. Another problem faced by flour mill workers was headache (60%) because of excessive noise at work place. 60 per cent respondents also suffered from eye irritation/ eye itching it may be due to flour

dust in the environment. 40 per cent respondents suffered from allergic Bronchitis. Only 20 per cent respondents suffered from Nausea during work. 60 per cent respondents had back ache due to bending at the time of packing of flour. It was due to improper posture adopted during the activity.

Similar results were reported by *Wagh, Pachpande, Patel, Attarde, Ingle (2006)* in a study on The influence of workplace environment on lung function of flour mill workers in Jalgaon urban center reveals reduced lung efficiency of flour mill workers due to excessive exposure to fine organic dust prevalent in the workplace environment. The impairment in lung efficiency was increased with duration of exposure in the flour mill workers. Investigator further stated that most of the workers were suffering from asthma and respiratory problems, 42 per cent of the flour mill workers were having shortness of breath problems, 34 per cent of workers were having frequent coughing, and 19% workers were having respiratory tract irritation

Problems faced while loading and unloading were related to transferring raw material (grains) to the process area. The hazard of suffocation in the

Table 3 Existing clothing practices of flour mill workers

n-30

Type of garment	Frequently		Occasionally		Never		WMS	
	f	%	f	%	f	%		
Upper garment	Shirt	05	16.67	10	33.3	15	50	0.66
	Kurta	27	91.11	03	9.89	-	-	1.9
	T- Shirt	-	-	10	33.33	20	66.67	.33
Lower Garment	Pant	05	16.67	10	33.33	15	50	0.66
	Pyajama	13	43.33	15	50.0	02	6.66	1.36
	Shorts	-	-	-	-	30	100	-
	Dhoti	20	66.67	05	16.67	05	16.67	1.5
Hands-Gloves	-	-	-	30	100	-	-	-
Head	Cap	-	-	-	-	30	100	-
	Saffa/pagdi	-	-	10	33.33	20	66.67	.33
Face	Mask	-	-	-	-	30	100	-
	Face cover	-	-	-	-	30	100	-
Feet	Chappal	22	73.33	05	16.67	03	10	1.63
	Shoes	05	16.67	15	50	10	33.33	0.833

grain area while emptying or shifting the grains was observed. All the bags and sacks were transferred by the hand to the final process area. But at the time of loading, the workers were carrying one bags / container of 15- 20 kg each at a time, on their shoulders or if the load is more than 20 kg than workers used to carry the load on their back which was the main reason for shoulder and backache. It was told by the authority that the hazard was communicated to them but there is an inherited ignorance among these local workers and they work in their own style. The researcher observed that working environment was quite unsafe and unhealthy for workers and also found occurrence of various health problems were due to work pressure, long working hours, monotonous work, and insufficient cleaning at the work place.

Existing clothing practices of flour mill workers

Information on existing clothing practices was also collected and it was found that majority of them were wearing *kurta* and *pajayama* and *dhoti* and *chapals* in feet. *T shirt* and *saffa* and *pagdi* was occasionally worn by the respondents. No one was wearing the cap/ hat and mask or face cover.

Use of personnel protective devices

Personal Protective Equipment (PPE) was not available and was not used. The workers in the work area were not wearing masks and caps on head. No ear muffs were used although noise level was quite high. The results of the various studies suggest that even after proper cleaning operations in flour mills, the flour milling may not be able to reduce the flour dust levels to below the TLV of 0.5 mg/m³. So the face masks in the work area are highly recommended. This would help to protect the workers health from the flour dust prevalent in the workplace environment.

CONCLUSION

This can be concluded that flour mill workers were facing the problems related to grinding, these were coughing and sneezing, eye irritation, breathlessness due to presence of flour dust in the work environment. Sweating was due to work pressure. Majority of respondents were wearing dhoti kurta followed by pant shirt. None of respondents were using personnel protective devices to protect themselves. It is recommended that awareness should be generated among flour mill workers about the use of personnel protective devices like face mask and ear muffs.

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