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Working atmosphere in rural enterprises and its effects on workers' health

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ABSTRACT

The study was aimed at the working atmosphere in rural enterprises and its effects on workers' health in selected villages of Dharwad Taluk of Karnataka state. The enterprises consisted of seventeen agro based enterprises. Data on drudgery experiences, metabolic discomfort and details of work stations were collected through interview with the help of questionnaire. The level of satisfaction of metabolic discomfort was measured on five points rating scale. The degree of work related drudgery experiences was analyzed in terms of rating of work demand, feeling of exhaustion, posture assumed at work, manual loads operative, difficulty in perception and work load perception on five point rating scale for each factor individually. Maximum metabolic discomfort was reported by the respondents involved in chilli pounding and weaving enterprises. This could be because of environmental stress factors like noise and dust and repeated movement of arms which scored 14.80 and 15.00 points respectively. Majority of men participated in technology related activities and women in cleaning of work stations of chilli pounding and vermicelli enterprises. Maximum drudgery in cleaning activity in vermicelli units and processing activity in chilli pounding was reported by the respondents. Women experienced maximum pain in hands and men experienced more pain in knees. Respondents encountered the major problems like heavy work, insufficient light, less chance for improvement, finances and lack of knowledge while performing the activities in chilli pounding unit. Hence there is a need for improving work environment of rural enterprises to avoid the health hazards and ultimately increase the working capacity, performance, productivity and improving the ergonomic gain.

Keywords: Enterprises; health; vermicelli; chilli pounding

INTRODUCTION

The rural entrepreneurs are the key to making India a powerful in the global economy. Conventional ways prevalent in rural enterprises are stress prone with implication of health hazards. The exposure of a person to these stresses may affect his health, performance and/or comfort. Musculoskeletal disorders are major problems in many industrial workers. The causative factors of musculoskeletal disorders are poor ergonomic design of work place and task including working organization, poor working posture, repetitive work, static work, frequent

bending and twisting, lifting and forceful movements and vibrations. Individual factors like age, sex, anthropometric, dimensions, muscle strength and physical fitness, lack of task variation, insufficient rest break, psychological and social factors contribute to musculoskeletal disorders (Perimalam et al 2005).

The environmental stresses namely noise, illumination, heat, vibration etc play a vital role in the proper functioning at a working place. As far as illumination was concerned it was suggested that work performance was increased with the increased level of illumination. The labour productivity was also found to improve with the increase in illumination. In a developing country like India proper attention is not paid to the working environment particularly in small to medium scale manufacturing units. The extent by which environmental heat may negatively affect work performance is in part influenced by the nature of work performed (Lind 1973).

Rural entrepreneurs face special problems and constraints. These are illiteracy, lack of vital information, fear to take risks, lack of skill, experience and training. In addition there are structural constraints in the form of inequality, limited purchasing power, condemnation by local elite etc. Hence the study was conducted to study the gender participation in enterprises, drudgery experiences, metabolic discomfort and work station problems faced by respondents/workers at work.

METHODOLOGY

The study was conducted in selected villages (Hebballi, Nigadi, Kavalageri and Nayakanahulikatti) in Dharwad district of Karnataka state. The sample comprised of seventeen agro-based rural enterprises viz vermicelli- 7, chilli pounding- 5, oil extraction- 3 and weaving- 2. Data on drudgery experiences, metabolic discomfort, gender participation in enterprises and problems encountered at work place were collected through interview method with the help of schedules. The level of satisfaction of metabolic discomfort was measured on five points rating scale (very comfortable- 5 to very discomfortable- 1). The disorder scores were given by collecting the data on types of disorder symptoms on various body parts like itching, burning, numbness/ stiffness, swelling and pain. The scoring was done for their level of tolerance of these symptoms (3 point scale), frequency of occurrence of these symptoms (5 point scale) and the impact of these symptoms on their work (3 point scale).

The degree of work related drudgery experiences was analyzed on five point rating scale for each factor individually in terms of rating of work demand, feeling of exhaustion, posture assumed at work, manual loads operative, difficulty in perception and workload perception

RESULTS AND DISCUSSION

Gender participation and level of drudgery

Table 1 indicates the gender participation and level of drudgery involved in each activity of the vermicelli enterprise and chilli pounding enterprises. It is clear from the data that energy related activities and technology related activities in vermicelli enterprises were mainly performed by men alone whereas the cleaning of workstations by women. The other two activities related to money and human resource management were performed by men with the support of women.

The level of drudgery experience was measured on factors like time demand on work, exhaustion, difficulty perception, posture at work, manual loads operative and workload. Maximum score was obtained on production process activity (15.52) followed by cleaning of work station (15.43) which were mainly performed by women. The technology related activities (12.89) performed mainly by men alone was the next drudgery prone activity.

Similar results were obtained in chilli pounding enterprise which shows that the technology related activities were performed by men alone. The performance of production process and cleaning of workstation activities were dominated by women. Since it is considered that women cannot do more skillful work they are supported by men. The other two activities related to money and human resource management were dominatingly performed by men and supported by women. The scores on drudgery experiences depicted that the process related activities were moderately time demanding, exhaustive, very difficult and heavy with a drudgery score of 19.1. Cleaning of workstations (14.00) was the next maximum drudgery involved activity followed by technology related (13.75) and human resource related activities (12.20).

Metabolic comfort at work place

Table 2 reveals the metabolic comfort/discomfort at work place. This was obtained by adopting five point scales and scoring was based on metabolic comfort/ discomfort due to heat, humidity, dust and other parameters. It was observed that maximum metabolic comfort was observed in weaving enterprise with a score of 15.00 followed by oil extraction unit with 13.67 score. Among the other two enterprises in which women were involved along with men vermicelli enterprise showed higher metabolic comfort with the score of 10.43 compared to the chilli pounding enterprise having a score of 8.80.

Comfort score for all parameters was lowest in chilli pounding enterprise which means the respondents experienced maximum discomfort in all parameters.

Table 1. Gender participation and drudgery level in vermicelli (no of units 7) and chilli pounding (no of units 5) enterprises

Activity		Gender participation	Score of drudgery experiences on						
			Work demand as per time	Work exhaustion	Difficulty perception	Operating posture in physical work	Manual loads operative	Manual work loads	Total score
Money management related	V	2.14	2.75	1.61	2.61	1.57	1.29	1.71	11.54
	C	2.30	2.20	1.40	2.00	1.05	1.00	1.95	9.60
Human resource Related	V	2.25	2.39	1.68	2.14	1.75	1.00	2.25	11.21
	C	2.50	2.40	2.00	2.60	1.19	1.10	2.20	12.20
Material related/ process related- production process	V	3.98	3.10	3.20	2.20	2.50	1.42	3.10	15.52
	C	3.95	3,20	4.10	4.40	2.10	1.50	3.80	19.10
Technology related	V	1.11	2.29	2.07	2.14	2.00	2.18	2.21	12.89
	C	1.00	2.40	2.10	2.55	1.70	2.40	2.60	13.75
Bio mass fuel/diesel/ energy use in enterprise related	V	0.75	1.44	1.00	1.13	0.75	1.50	1.81	7.63
	C	-	-	-	-	-	-	-	-
Marketing related	V	-	-	-	-	-	-	-	-
	C	-	-	-	-	-	-	-	-
Any other (cleaning of workstation)	V	4.29	2.43	2.86	2.43	2.57	2.57	2.57	15.43
	C	3.80	2.60	2.20	2.20	2.40	2.00	2.60	14.00

W: Women, M: Men, V: Vermicelli, C: Chilli pounding

Table 2. Metabolic comfort/discomfort at the work place

Enterprise	Metabolic comfort/ discomfort due to heat	Metabolic comfort/ discomfort due to humidity	Metabolic comfort/ discomfort due to dust	Metabolic comfort/ discomfort on any other parameter	Total score
Vermicelli	3.43	2.86	3.29	0.86	10.43
Chilli pounding	2.60	2.40	1.40	2.40	8.80
Oil extraction	3.33	3.33	3.67	3.33	13.67
Weaving	4.00	4.00	3.00	4.00	15.00

Discomfort due to dust was highest followed by humidity and heat in chilli pounding enterprise. In vermicelli enterprise metabolic comfort scores were lowest for other parameters like posture, pain in body parts etc next to chilli unit. It was vermicelli unit which scored lower for metabolic comfort due to humidity and dust. Among the four enterprises the respondents in weaving unit had maximum score 4 for heat, humidity and any other parameter.

Work related body disorders

Table 3 shows work related body disorders among men and a woman as expressed by them in vermicelli and chilli pounding enterprises. Work related body disorders were scored on the basis of scoring on symptoms, body tolerance to symptoms, symptom frequency and their impact on work.

Men experienced pain in lower back, knees and lower legs. They expressed that pain in knees was bearable and did not occur very often whereas pain in lower back and lower legs was ignorable and the symptom frequency was very often and all these pains did not have any impact on work. Among the various body discomfort men gave maximum score for knees (11) followed by pains in lower back and lower legs (9).

Women experienced numbness/ stiffness in hands, swelling in lower legs and pain in knees and lower back. All these symptoms were ignorable as expressed by women. The symptoms frequency was rarely with regard to numbness/stiffness of hands, swelling of lower leg and pains in lower back whereas pain in knees occurred sometimes doing work. These symptoms did not have any impact on work. Maximum score was given to pain in knees (10) followed by pain in lower back (9)

among the various body disorders. Swelling of lower leg (8) and numbness/ stiffness of hands (7) scored lower.

In chilli pounding enterprise men experienced pain in knees, swelling in lower legs and burning in eyes, nose, wrist, hands and feet. Except burning of feet all the body disorders were bearable (score ranging between 1.5 to 2). Burning in nose, wrist, hands and feet was always experienced by men and burning in lower legs was not very often. All mentioned that body disorders did not have impact on their work. Among the various body disorders men gave maximum score for knees (10.50), nose (10), wrist (9.67), hands (9.50) and lower legs (9.34). Lowest score for eyes and feet (9 each) was given by male respondents.

Likewise women experienced burning in eyes, nose, wrist, lower legs and feet, pain in hands and swelling in knees. All the body disorders were bearable (score ranging between 1.67 to 2) whereas pain in hands was unbearable. Burning in nose and lower legs was always experienced by women and burning in eyes, feet and pain in wrist occurred very often. Pain in hands and swelling in knees were noticed rarely by women. All the body disorders did not have impact on work and pain in hands temporarily terminated their work. Among the listed body disorders women gave maximum score to hands (12) followed by burning in nose and lower legs (10). Burning in eyes, wrist, feet and swelling in knees scored lowest score ranging between 8.50 to 9.

Design of the workstation

Table 4 depicts workstation design of chilli pounding enterprise. Average area of work station of chili pounding enterprise was 24.08 sqm. Both natural and artificial sources of illumination were available in all the units. The room consisted of two doors and one ventilator each. Three units had Kadapa stoned floor and two were mud floored. Two workstations had tile floor and were sheet roofed. One had wooden roof. It was also found that on an average three persons were working in each unit.

Occupational problems encountered by workers

Table 5 shows occupational problems encountered at work. In chilli pounding enterprise respondents experienced number of problems while performing the activity and all the respondents felt that chilli pounding activity was a heavy work. Majority of respondents (60%) listed long working hours and lack of knowledge of latest technologies as the problems encountered during work. Less than fifty per cent of the respondents expressed insufficient light, less chance for improvement and finance as the problems encountered while performing the activity whereas only 20 per cent of them encountered the problems like improper

Table 3: Work related body disorders in vermicelli and chilli pounding enterprises activities experienced by men and women

Body part		Symptoms (score)		Body tolerance to symptoms (score)		Symptom frequency (score)		Impact of symptom (score)		Total score	
		W	M	W	M	W	M	W	M	W	M
Eyes	V	-	-	-	-	-	-	-	-	-	-
	C	2.00	2.00	1.75	2.00	3.75	4.00	1.00	1.00	8.50	9.00
Nose	V	-	-	-	-	-	-	-	-	-	-
	C	2.00	2.00	2.00	2.00	5.00	5.00	1.00	1.00	10.00	10.00
Neck	V	-	-	-	-	-	-	-	-	-	-
	C	-	-	-	-	-	-	-	-	-	-
Shoulder	V	-	-	-	-	-	-	-	-	-	-
	C	-	-	-	-	-	-	-	-	-	-
Upper arms	V	-	-	-	-	-	-	-	-	-	-
	C	-	-	-	-	-	-	-	-	-	-
Elbows	V	-	-	-	-		-	-	-	-	-
	C	-	-	-	-	-	-	-	-	-	-
Lower arms	V	-	-	-	-	-	-	-	-	-	-
	C	-	-	-	-	-	-	-	-	-	-
Wrists	V	-	-	-	-	-	-	-	-	-	-
	C	2.00	2.00	1.75	2.00	4.25	4.67	1.00	1.00	9.00	9.67
Hands	V	3.00	-	1.00	-	2.00	-	1.00	-	7.00	-
	C	5.00	2.00	3.00	1.50	2.00	5.00	2.00	1.00	12.00	9.50

Chest	V	-	-	-	-	-	-	-	-	-	-
	C	-	-	-	-	-	-	-	-	-	-
Abdomen	V	-	-	-	-	-	-	-	-	-	-
	C	-	-	-	-	-	-	-	-	-	-
Upper back	V	-	-	-	-	-	-	-	-	-	-
	C	-	-	-	-	-	-	-	-	-	-
Lower back	V	5.00	5.00	1.00	1.00	2.00	2.00	1.00	1.00	9.00	9.00
	C	-	-	-	-	-	-	-	-	-	-
Buttocks	V	-	-	-	-	-	-	-	-	-	-
	C	-	-	-	-	-	-	-	-	-	-
Hips	V	-	-	-	-	-	-	-	-	-	-
	C	-	-	-	-	-	-	-	-	-	-
Upper legs	V	-	-	-	-	-	-	-	-	-	-
	C	-	-	-	-	-	-	-	-	-	-
Knees	V	5.00	5.00	1.00	2.00	3.00	3.00	1.00	1.00	10.00	11.00
	C	3.50	5.00	1.67	1.50	2.33	3.00	1.00	1.00	8.50	10.50
Lower legs	V	4.00	5.00	1.00	1.00	2.00	2.00	1.00	1.00	8.00	9.00
	C	2.00	4.00	2.00	1.67	5.00	2.67	1.00	1.00	10.00	9.34
Ankles	V	-	-	-	-	-	-	-	-	-	-
	C	-	-	-	-	-	-	-	-	-	-
Feet	V	-	-	-	-	-	-	-	-	-	-
	C	2.00	2.00	1.67	1.00	4.00	5.00	1.00	1.00	8.67	9.00

W: Women, M: Men, V: Vermicelli, C: Chilli pounding

Table 4. Design of the workstation of chilli pounding enterprise

Area	24.08 sqm
Average no of windows/ventilators	1.40
Average no of doors	1.60
Type of floor	
Mud	2
Kadapa stone	3
Type of roof	
Sheet & tiles	1
Tiles	2
Sheet	1
Wood	1
Source of illumination during working hours	Natural and artificial
No of operational units	1
Average no of workers	2.8

Table 5. Response of the respondents wrt occupational problems encountered at work

Problem	Yes (%)	No (%)
Improper ventilation	20	80
Inadequate equipments	20	80
Insufficient light	40	60
Heavy work	100	0
Long working hours	60	40
Less chances of improvement	40	60
Financial problems	40	60
Lack of knowledge	60	40
Organizational	0	100
Input supply	20	80
Marketing problem	0	100
Not able to site any specific problems	0	100
Any other	0	100

ventilation, inadequate equipment and input supply.

CONCLUSION

Chilli pounding enterprise was identified most drudgery involved enterprise with maximum occupational discomforts experienced by men and women involved in it. Hence it is necessary to expose the entrepreneurs to latest technologies of the work so as to create good working environment for them so that they remain healthy and thus the output is increased.

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