Ekta
Department of Family Resource
Management, COHS,
CCS Haryana Agricultural
University, Hisar, Haryana,
India

Rupal Hooda
Department of Family Resource
Management, COHS,
CCS Haryana Agricultural
University, Hisar, Haryana,
India

Manju Mehta
Department of Family Resource
Management, COHS,
CCS Haryana Agricultural
University, Hisar, Haryana,
India

Prevalence of musculoskeletal disorders among garment industry

Ekta, Rupal Hooda and Manju Mehta

Abstract
Indian sub continent is the second largest manufacturer of garments after china being the global leader in garment production. Today the way of technological advancement and use of sophisticated machinery it has enabled the manufacturers to achieve better quality and well designed garments. Occupational health hazard is concerned with health hazard in relation to work environment. Effective application of ergonomics in work system design can achieve a balance between worker characteristics and task demands. With the 3 objectives, a study was conducted on 50 workers working in garment industry of Jaipur. A questionnaire was used for collecting general information and for specific information. Data highlighted that 54% of the respondents belonged to the age group of 33-43 years followed by 44% of the respondents having the work experience of above 10 years. Majority (94%) of respondents having sufficient space to work followed by 80.00 percent of the workers said that temperature is good according to their working environment. More than half of the workers had pain in knee (66%) and dull eye sight (78%). Moderate discomfort was mentioned by 70 percent of the respondent in neck followed by 44 percent in lower back and 22 percent in shoulder. Conclusively, Ergonomics play an important role in making the workplace as efficient, safe and comfortable as possible and at the same time enhance human performance.

Keywords: Musculoskeletal disorders, health problems, garment industry

Introduction
The garment industry is a major contributor to the economies of many countries. Indian sub continent is the second largest manufacturer of garments after china being the global leader in garment production. India is known for its high quality garments for men and most of the garment manufacturers are in the small and medium scale industry. India garment industry has an advantage as it produces and exports stylish garments for men and women at economical prices due to cheap labor rates. Today the way of technological advancement and use of sophisticated machinery it has enabled the manufacturers to achieve better quality and well designed garments. The members include those who are working as tailors, embroidery worker, self employed tailors etc. Health is a state of complete physical, mental and social wellbeing and not merely the absence of diseases or infirmity. Occupational health hazard is concerned with health hazard in relation to work environment. The science of occupational health hazards covers a wide field, like work physiology, occupational hygiene, occupational psychology, occupational toxicology etc. Ergonomics also play an important role in making the workplace as efficient, safe and comfortable as possible and at the same time enhance human performance. If work tasks and equipment do not include ergonomic principles in their design, workers may have exposure to undue physical stress, strain, and overexertion, including vibration, awkward postures, forceful exertions, repetitive motion, and heavy lifting. Recognizing ergonomic risk factors in the workplace is an essential first step in correcting hazards and improving worker protection. Effective application of ergonomics in work system design can achieve a balance between worker characteristics and task demands, enhancing worker productivity, provide worker safety, physical and mental well-being and job satisfaction.

Objectives of the study
1. To assess the socio-economic background of workers working in industry.
2. To assess work space design and work organization of the industry.
3. To identify the health status and impact of work environment on the workers.

Corresponding Author:
Ekta
Department of Family Resource
Management, COHS,
CCS Haryana Agricultural
University, Hisar, Haryana,
India

Review of literature
Mehta (2012) showed that most of the workers in cutting room had discomfort at neck shoulder and back (28.5%) as they have to lean forward on the cutting table for performing their task. This was followed by discomfort of arm (14.5%). The stitching section, the majority of the workers had the back problems (27.2%) followed by stiffness at neck and shoulder (22.7%), leg (27%), elbow (7%), arm (6%) and wrist and leg (12%).

Singh, *et al.* (2012) [8] showed that about 20.33% of the workers were under high risk levels and required immediate change. About 45.32% of the workers were at lower risk levels and 34.33% of the workers were at medium risk levels. The present Study recommended the awareness and proper ergonomics training to the workers.

Singh, *et al.* (2013) [1] found that about 7.63% of the workers were under very high risk levels and required immediate change. About 44.6% of the workers were at high risk levels which required changes soon and 45.03% of the workers were at medium risk levels. About 2.67% of the workers were at lower risk levels.

Kumar, *et al.* (2014) [4] revealed that the goal of ergonomics is to reduce work related musculoskeletal disorders by adapting the work to fit the person, instead of forcing the person to adapt to the work. The results shown that a study of ergonomic investigation about the working culture in the micro, small and medium scale industries in Jharkhand and their effect on the net productivity.

Methodology
Locale of the study: Jaipur city of Rajasthan state was selected purposively for the locale of present study.

Selection of area: Garment industry of Jaipur city was selected randomly.

Selections of sample: From garment industry of Jaipur city, 50 respondents were selected

Variable and their measurement: Independent and dependent variables were selected for this study.

Independent variable: schedules were prepared for independent variables.

a) Personal variable: Age**,** Gender, Education and Occupation

b) Social variables: Caste, Marital status and Annual income of the family

Dependent variable: Work space, Environmental conditions

Tools of data collection
Data were collected personally by researcher. The respondents were informed about the purpose of the study clearly. A questionnaire was used for collecting general information and for specific information.

Analysis and interpretation of data
After collecting data, the codes were assigned for detailed analysis. Based on the finding of the study and conclusions drawn on the basis of statistical analysis results were interpreted and recorded in the report.

Results
Table 1 showed that majority (54.00%) of the respondents belonged to the age group of 33-43 years. In respect to marital status, maximum (54.00%) of the respondents were married and qualification of maximum (30.00%) of the respondents were senior secondary followed by (30.00%) respondents were graduate. Maximum (48.00%) of the respondents having their monthly family income between Rs.30001-60000/ per month. Regarding family type, (62.00%) of the respondents was belonged to nuclear family.

Table 1: Socio Economic Status of the Respondents (n=50)

Sr. No.	Factors	Detail	Male (25)	Female (25)	Total (50)
1	Age	22-32	9	5	14 (28.00)
		33-43	13	14	27 (54.00)
		44-55	3	6	9(18.00)
2	Marital status	Married	14	13	27(54.00)
		Unmarried	7	7	14(28.00)
		Separated	4	5	9(18.00)
3	Education	Middle	5	3	8(16.00)
		Secondary/ Sr. Second	6	9	15(30.00)
		Graduate	7	8	15(30.00)
		Post-graduate	7	5	12(24.00)
4	Monthly family income	Up to Rs.30000/-	10	9	19(38.00)
		Rs.30001-60000/-	13	11	24(48.00)
		Rs. 60001-90000/-	2	5	7(14.00)
5	Family type	Nuclear	14	17	31(62.00)
		Joint	11	8	19(38.00)

Table 2 showed that work organization of the respondents. Majority (44.00%) of the respondents having the work experience of above 10 years. Maximum (52.00%) of the respondents were duration of work was <7 and more than half of the respondents (82.00%) were took break during the work. Maximum numbers of the respondents (82.00%) were took break of fixed duration and (88.00%) respondents were work along with others.

Table 2: Work organization of the respondents (n=50)

Details		Male (25)	Female (25)	Total (50)
Years of experience (Years)	Up to 5	4	6	10(20.00)
	5-10	8	10	18(36.00)
	Above 10	13	9	22(44.00)
Duration of work	Up to 7	15	11	26(52.00)
	8 hours	10	14	24(48.00)
Take break during work	Yes	22	19	41(82.00)
	No	3	6	9(18.00)
Break of fixed duration	Yes	19	22	41(82.00)
	No	6	3	9(18.00)
Working pattern	Alone	2	4	6(12.00)
	With others	23	21	44(88.00)

Table 3 showed that the work space design. All respondents (100%) used motorized machines for stitching and (94.00%) respondents having sufficient space to work. Majority of the respondents (88.00%) used arm rest for their hands and (88.00%) respondents having back rest for chairs and (86.00%) respondents having seat height adjustable.

Table 3: Work Space Design (n=50)

Factors	Male (25)		Female (25)		Total (50)	
	Yes	No	Yes	No	Yes	No
Having sufficient space to work	23	2	24	1	47(94.00)	3(6.00)
Work space permit stable neutral posture	21	4	25	-	46(92.00)	4(8.00)
Work motorized	25	-	25	-	50(100.00)	-
Seat height adjustable	20	5	23	2	43(86.00)	7(14.00)
Chair have back rest	25	-	19	6	44(88.00)	6(12.00)
Work surface appropriate for visual and manual requirements	25	-	24	1	49(98.00)	1(2.00)
Use foot rest while working	23	2	18	7	41(82.00)	9(18.00)
Use lumbar pads	20	5	21	4	41(82.00)	9(18.00)
Use arm rest	25	-	19	6	44(88.00)	6(12.00)

Table 4 give the details of impact of work environment on the workers discovered that 80.00 percent of the workers said that temperature is good according to their working environment followed by 60.00 percent found good illumination over there and 36.00 percent found negative working environment in regards to noise. The noise of the industry may affect the health and comfort of the worker.

Table 4: Impact of work environment on the workers (n=50)

Parameters	Positive	Neutral	Negative
Lighting (Lux)	30 (60.00)	20 (40.00)	-
Noise (dBA)	10 (20.00)	22 (44.00)	18 (36.00)
Temperature (C)	40 (80.00)	10 (20.00)	-
Humidity (%)	38 (76.00)	5 (10.00)	7 (14.00)

Data related to the general health status of workers presented in table 5 revealed that 78.00 percent of them had dull eye sight. More than half of the workers had pain in knee (66.00%). Most of them had good level of hygiene and 48.00% of them had dry skin. The very common medical problem indicated by the respondents was asthma (76.00%) followed by diabetes (36.00%). Five percent had breathlessness.

Table 5: Health status of the workers working in the industry (n=50)

Details		Male (25)	Female (25)	Total (50)
Knee pain	Yes	15 (30)	18 (36)	33 (66.00)
	No	10 (20)	7 (14)	17 (34.00)
Eye sight	Dull	17 (34)	22 (44)	39 (78.00)
	Clear	6 (12)	2 (4)	8 (16.00)
	Use lens	2 (4)	1 (2)	3 (6.00)
Skin	Smooth	10 (20)	5 (10)	15 (30.00)
	Dry	11 (22)	13 (26)	24 (48.00)
	Wrinkle	4 (8)	7 (14)	11 (22.00)
Hygiene	Good	20 (40)	22 (44)	42 (84.00)
	Moderate	5 (10)	3 (6)	8 (16.00)
	poor	-	-	-
Asthma	Yes	18 (36)	20 (40)	38 (76.00)
	No	7 (14)	5 (10)	12 (24.00)
Diabetes	Yes	11 (22)	7 (14)	18 (36.00)
	No	14 (28)	18 (36)	32 (64.00)

Breathlessness	Yes	3 (6)	2 (4)	5 (10.00)
	No	22 (44)	23 (46)	45 (90.00)

Table 6 shows that workers facing discomfort while working was severe discomfort in the lower back was mentioned by 20 percent of the workers. Extreme discomfort was mentioned by 10 percent of the respondents. Moderate discomfort was mentioned by 44.00 percent of the respondent in lower back followed by 70.00 percent in neck and 22.00 percent in shoulder. Body part experienced extreme pain was shoulder, neck, knee and lower back and that too by very few percent of the respondents. All the subjects agreed that they had no discomfort on the foot and heel; other parts which experienced no discomfort for majority of workers were wrist, palm forearm and elbow.

Table 6: Body part experiencing discomfort while working (n=50)

Body parts	Discomforts				
	ND	MD	MOD	SD	ED
Headache	10 (20.00)	25 (50.00)	5 (10.00)	5 (10.00)	5 (10.00)
Neck	7 (14.00)	35 (70.00)	4 (8.00)	2 (4.00)	2 (4.00)
Shoulder	14 (28.00)	11 (22.00)	15 (30.00)	5 (10.00)	5 (10.00)
Elbow	22 (44.00)	8 (16.00)	20 (40.00)	-	-
Fore arm	44 (88.00)	6 (12.00)	-	-	-
Wrist and hand	42 (84.00)	8 (16.00)	-	-	-
Palm and fingers	40 (80.00)	8 (16.00)	2 (4.00)	-	-
Lower back	20 (40.00)	22 (44.00)	8 (16.00)	-	-
Knee	5 (10.00)	40 (80.00)	5 (10.00)	-	-
Upper leg	35 (70.00)	9 (18.00)	6 (12.00)	-	-
Lower leg	12 (24.00)	8 (16.00)	15 (30.00)	10 (20.00)	5 (10.00)
Foot	50 (100)	-	-	-	-
Heel	50 (100)	-	-	-	-

Discomforts: ND-No Discomfort, MD - Mild Discomfort, MOD- Moderate Discomfort, SD- Severe Discomfort, ED- Extreme Discomfort.

Conclusion
Study shows that the maximum number of respondents were (54.00%) belonged to the age group of 33-43 years. In respect to marital status, maximum (54.00%) of the respondents were married. Regarding family type, (62.00%) of the respondents was belonged to nuclear family. Maximum numbers of the respondents (82.00%) were took break of fixed duration and (88.00%) respondents were work along with others. All respondents (100%) used motorized machines for stitching and (94.00%) respondents having sufficient space to work. Eighty percent of the workers said that temperature is good according to their working environment and 60.00 percent found good illumination over there. 78.00 percent of them had dull eye sight. More than half of the workers had pain in knee (66.00%). Moderate discomfort was mentioned by 44.00 percent of the respondent in lower back followed by 70.00 percent in neck and 22.00 percent in shoulder.

References
1. Chaudhary H, Singh J. A Study of Work Related Musculoskeletal Disorders By Using Rula and Reba Among the Workers Working in A Card-Board Industry. IJSR - International journal of scientific research. 2013; 2(9):142-144.
2. Chopde RA, Desmukh TR. Ergonomic Survey in Garment Manufacturing Industry: A Research Introduction. International journal of science, spirituality, Business and technology (IJSSBT), 2018; 6(2): ISSN 2277-7261.
3. Hassan K, Khalid M, Zafar S, Ahmad A, Gilani SA, Imran A. Prevalence, Risk Factors, Description and Intensity of Neck Pain in Sewing Machine Operators. International Journal of Scientific & Engineering Research 2017; 8(7):1040 ISSN 2229-5518
4. Kumar RG, Roy SC. Ergonomic Investigation and their Effect on Productivity of Micro, Small & Medium Industry of Jharkhand State, International journal of industrial engineering research and development (IJIERD), 2014; 5(3):01-12.
5. Mehta R. Major Health Risk Factors prevailing in Garment Manufacturing Units of Jaipur. J Ergonom 2012; 2:102. DOI: 10.4172/2165-7556.1000102
6. Mali SC, Vyavahare RT. An Ergonomic Evaluation of An Industrial Work Station: A review. International Journal of Current Engineering and Technology, 2015; 5(3) E-ISSN 2277-4106, P-ISSN 2347-5161
7. Merisalu E, Mannaste M, Hiir K, Traumann A. Predictors and Prevalence of Musculoskeletal Disorders Among Sewing Machine Operators, Agron. Res., 2016; 14(4):1417-1426.
8. Singh J, Lal H, Kocher G. Musculoskeletal Disorder Risk Assessment in small scale forging Industry by using RULA Method, International Journal of Engineering and Advanced Technology (IJEAT), 2012; 1(5):513-518.