

Musculo-skeletal Problems of Women Weavers in Handloom Industry of Lakhimpur District, Assam

GeetashreeBori

Assistant professor, ,Deptt. Of Home Science,Moran MahilaMahavidyalaya,Sivsagar,Assam.

Abstract- Handloom industry plays a vital role in the socio-cultural and economic life of the people. It is dependent on manual labor and here the major contribution comes from women. The present study was conducted on women workers, who perform the activities in handloom industry of Lakhimpur district of Assam to find out the musculo-skeletal problems and perceived joint discomfort of their body due to uncomfortable working postures. Various parameters observed were weight, height, angle of deviation, time and body mass index (BMI). A five point scale given by Vergese et al (1995) was used to record the musculo- skeletal problems and perceived joint discomfort. A sample of 40 women workers of Lakhimpur district Assam was selected for the study through multistage random sampling. Statistical analysis of the data are employed through frequency, percentage, mean, standard deviation, critical difference and coefficient of correlation. Maximum joint discomfort was found in the waist(4.02) followed by finger (3.85), wrist (3.55), elbow (3.47), shoulder (3.45), and in knee(2.72) respectively while performing different activities in handloom. About 47.5% respondents perceived very severe pain in back. Less than 45% respondents made complaint of severe pain in low back. The 57.6% respondents made complain of moderate pain in leg followed by mild pain in fingers (32.5%) and knee (12.5%).

Index Terms- Handloom, Joint discomfort, Musculo skeletal, Women workers

I. INTRODUCTION

Handloom Industry in India is ancient cottage industry with a decentralized set up spread through the length and breadth of the country and Assam accounts for the highest concentration of handloom industry {census of handloom in India (2009-10) NCAER, New Delhi} engaging about 12 lakhs persons. It is dependent on manual labour and here the major contribution comes from women. A great deal of research has been under gone in analyzing the postural effort for various purpose while people may still be unaware of the same. Next to agriculture ,handloom plays a predominant place in rural economy of the state and women are the main working force in the handloom industry. While at work the weavers have to adopt postures without giving consideration to their individual capability which results in stress and trauma the workersexperience. Sitting for

active work is not the same in its demand on the body as sitting quietly at rest. Hence comfortable postures at work is always important for a worker, because uncomfortable posture or bad posture may increase load on lumber spine and different body segments or body joints. Considering the workload of industrial workers and evaluating the problem that exist when working in an industry a critical assessment of workplace design, method of work, functioning of muscles is done which produce the movement of joints and maintain postures. Based on this rational, the objective of the present study was - to ascertain the perceived joint discomfort and musculoskeletal problems faced by the women respondents.

II. MATERIALS AND METHODOLOGY

A sample of 40 women workers of Lakhimpur district, Assam were selected for the study through multistage random sampling. Descriptive cum experimental research design was used in the present study and tool employed for the data collection was interview schedule. For experimental data various parameters were used i.e. weight ,height and time were recorded by weighing balance, anthropometric rods and stopwatch. Five point scale given by Vergese *et al.* (1995) was used to record the musculoskeletal problems and perceived joint discomfort. Statistical analysis of the data were employed through frequency, percentage, mean, standard deviation, Critical difference while inferential statistics employed were coefficient of correlation.

III. RESEARCH FINDINGS

It was observed from the study that majority (47.5%) of the respondents belong to age group 31 to 40 years. The highest mean height of the respondent were found to 155.33cm and the highest mean weight was found to be 55.08 kg. While assessing body mass index for physical fitness maximum (90%) respondents belonged to the category 18.5-25.0 was found normal. Maximum (60%) of the respondents were engage in various activities in handloom industry for 5-10 years. The hours of work was found to be 7-8 hours per day for all the respondents in all the handloom industry. The findings of the study are presented in the following head.

Table-1: Distribution of the respondent according to rating of perceived joint discomfort in various static activities
Number of Samples: 40

Sl. no.	Joint Movements involved	Activities											
		Threading the reeds/healds		Throwing the shuttle		Drawing the reed to and fro		Paddling		Putting designs in the fabric		Drawing the harness	
		Mean	S.D	Mean	S.D	Mean	S.D	Mean	S.D	Mean	S.D	Mean	S.D
1	Neck	3.8	27.54	2.7	9.44	2.95	13.49	-	-	3.6	25.97	2.95	15.61
2	Elbow	2.75	15.03	3.47	22.40	2.77	14.70	-	-	2.87	14.77	3.45	10.25
3	Finger	3.6	22.47	2.92	15.21	3.52	22.81	-	-	3.47	26.41	3	9.88
4	Wrist	3.5	23.62	3.3	21.47	3.55	21.31	-	-	3.52	22.09	3.4	12.94
5	Shoulder	2.9	23.76	3.42	24.51	3.5	21.11	-	-	3.12	13.66	3.62	11.77
6	Waist	2.85	15.59	3.12	16.79	2.97	16.31	2.5	11.47	2.97	11.80	-	-
7	Knee	-	-	-	-	-	-	2.7	10.10	-	-	-	-
8	Ankle	-	-	-	-	-	-	2.5	8.56	-	-	-	-

Table-2: Distribution of the respondents according to rating of perceived joint discomfort in various dynamic activities.**Number of Samples: 40**

Sl.no.	Joint movements involved	Activities					
		Warping		Setting the warp on the loom		Preparing the loom for weaving	
		Mean	S.D	Mean	S.D	Mean	S.D
1	Neck	2.82	17.72	2.9	17.42	2.55	15.43
2	Elbow	3.55	21.70	3.32	19.04	3.45	21.43
3	Finger	2.85	15.15	2.97	15.07	2.55	11.37
4	Wrist	3.62	25.21	3.42	24.32	3.05	18.40
5	Shoulder	3.65	27.74	8.6	27.7	3.45	20.08
6	Waist	4.02	29.02	2.82	13.22	2.65	11.62
7	Knee	2.95	16.34	2.7	15.40	3.0	12.24
8	Ankle	2.67	14.34	2.75	14.37	2.85	11.36

Table-3: Distribution of respondents according to rating of perceived joint discomfort in both static and dynamic activities.**Number of Samples: 40**

Sl. no.	Joint movement s involved	Activities									
		Spinning		Winding		Twisting		Reaching for the doobby		Beam getting	
		Mean	S.D	Mean	S.D	Mean	S.D	Mean	S.D	Mean	S.D
1	Neck	2.67	17.65	3.60	23.67	3.05	18.84	3.37	19.13	2.05	18.35
2	Elbow	3.75	24.90	2.72	17.96	3.4	22.46	2.9	10.98	2.3	23.60
3	Finger	3.85	28.35	2.97	19.13	3.15	21.27	2.7	8.90	2.15	20.31
4	Wrist	2.8	24.29	3.17	25.86	3.3	17.30	3.3	16.34	2.3	23.59
5	Shoulder	2.3	9.52	2.62	17.20	2.8	17.44	3.45	20.88	2.27	23.11
6	Waist	2.27	8.84	2.5	16.32	2.75	15.16	3.47	19.62	2.3	23.59
7	Knee	-	-	-	-	2.95	16.64	2.77	11.27	2.1	19.21
8	Ankle	-	-	3.57	25.21	2.85	13.73	2.75	16.36	2.17	20.80

In order to find out the severity of the perceived joint discomfort of the respondents in performance of various activities a rating scale was developed categorized as “No joint discomfort”, “Just noticeable” , “Tolerable”, and “Intolerable” joint discomfort .Table 1,2,3 depicts that the rating of perceived joint discomfort varies depending upon the task they perform .Maximum joint discomfort felt by the respondent while spinning, threading the

reeds/healds and putting designs in the fabric was found in the finger i.e., 3.85, 3.6 and 3.47 respectively. The severity of the joint discomfort felt by the respondents while setting the warp on the loom, preparing the loom for weaving and drawing the harness was found in the shoulder i.e. 3.32, 3.45 and 3.6 respectively. Majority of the respondents perceived severe joint discomfort while twisting, throwing the shuttle and beam getting in elbow i.e. 3.15, 3.47, and 2.3 respectively. While warping and reaching for the dobbie the maximum joint discomfort was felt in waist i.e. 4.02 and 3.47 respectively. Joint discomfort felt by the respondents while drawing the reed to and fro was found in wrist 3.55 and while paddling was found in the knee 2.725.

Table-4: Distribution of the respondents according to occurrence of musculo-skeletal problems.
Number of Samples: 40

Sl.No.	Body parts	Frequency of occurrence		
		Always	Sometimes	Rarely
1	Back	13 (32.5)	26 (65)	1 (2.5)
2	Shoulder	12 (30)	25 (62.5)	3 (7.5)
3	Shoulder joint	17 (17.5)	31 (77.5)	2 (5)
4	Neck	27 (67.5)	13 (32.5)	1 (2.5)
5	Leg	11 (27.5)	25 (62.5)	4 (10)
6	Elbow joint	10 (25)	28 (70)	2 (5)
7	Hand	14 (35)	26 (65)	-
8	Finger	12 (30)	26 (65)	2 (5)
9	Knee	12 (30)	25 (62.5)	3 (7.5)
10	Low back	29 (72.5)	8 (20)	3 (7.5)
	Mean	14.7	23.3	2.1
	S.D	7.27	7.0875	1.1972
	't'	-2.677*	5.4055**	9.3268**

**1% level of significant

*5% level of significant

Table-5: Distribution of the respondents according to musculo-skeletal problems in different body parts while performing various activities.

Number of Samples: 40

Sl. no.	Body parts	Very Severe	Severe	Moderate	Mild	Very mild	Scores	Rank	Standard Deviation
1	Back	19 (47.5)	15 (37.5)	4 (10)	2 (5)	-	4.272	II	41.643
2	Shoulder	8 (20)	12 (30)	18 (45)	2 (5)	-	3.775	IV	25.984
3	Shoulder joint	7 (17.5)	4 (27.5)	15 (37.5)	6 (15)	1 (2.5)	3.425	V	19.857
4	Neck	16 (40)	14 (35)	20 (25)	-	-	4.150	III	35.088
5	Leg	-	10 (25)	22 (55)	6 (15)	2 (5)	2.975	VI	28.586
6	Elbow	-	5	23	10	2	2.750	VIII	28.026

	joint		(12.5)	(57.5)	(25)	(5)			
7	Hand	2 (5)	6 (15)	20 (50)	12 (30)	-	2.95	VII	22.733
8	Finger	-	3 (7.5)	20 (50)	13 (32.5)	4 (10)	2.55	X	24.265
9	Knee	1 (2.5)	5 (12.5)	17 (42.5)	12 (30)	5 (12.5)	2.625	IX	18.854
10	Low back	3 (7.5)	18 (45)	13 (32.5)	6 (15)	-	5.625	I	22.653

Table-6: Co-efficient of correlation value showing relationship between dependent and independent variables.
Number of Samples: 40

Dependent variables	Independent variables	Correlation coefficient (r)	't' value
Perceived joint discomfort	Age	0.853**	10.294** (P<0.001)
	Years of involvement	0.566 **	4.296** (P<0.01)
	Body mass index	0.137	0.857
Musculo skeletal problem	Age	0.616**	4.809** (P<0.001)
	Years of involvement	0.6293**	5.032** (P<0.01)
	Body mass index	0.199	1.254

*Significant at 5% level

**Significant at 1% level

Table 4. Illustrated that majority of the respondents faced the occurrence of musculo-skeletal problems “Sometimes” in shoulder joint, back, hand and finger. The occurrence of musculo-skeletal problem was found “rarely” in shoulder, knee and low back in majority of the respondent. From the table 5. and the figure it is clear that about 47.5 per cent respondents perceived “Very severe” pain in back. Less than 45% respondents made complaint of “severe” pain in low back. Maximum (57.6%) respondents made complaint of moderate pain in leg. Less than 32 per cent respondents were found having mild pain in fingers. Only 12.5per cent respondents made complain of “very mild” pain in knee. Mean value 5.625 showed that maximum severity of musculo-skeletal problems was found in low back of the respondents. Table 6. Illustrates the correlation value of perceived joint discomfort and musculo-skeletal problems was found significant with the age and years of involvement at 1 per cent level of significance and 5per cent level of significance. The ‘t’ value of perceived joint discomfort and musculo-skeletal problem was found significant with age and years of involvement at 1per cent level of significance.

IV. CONCLUSION

It can be concluded that the posture adopted by the respondents while performing different activities in the handloom industry was found to be poor and improper. The respondents had to bend in almost 90° increases stress on low back of the user. Poor postures have found a great impact on health in the musculo-skeletal system. The respondents were

found to adopt inadequate postures while performing various activities.

These unnatural postures causing joint discomfort and severe musculo-skeletal problems in the long run. Joint discomforts were found maximum in finger, neck, waist, elbow shoulder and knee respectively. On the whole the perceived joint discomfort and musculoskeletal problems were high due to long period of service.

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AUTHORS

First Author – GeetashreeBori, Assistant professor, Deptt. Of Home Science, Moran MahilaMahavidyalaya, Sivsagar Assam, Email: geetashree_bori@Yahoo.co.in

