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## RESEARCH ARTICLE

### A STUDY ON ANTHROPOMETRIC MEASUREMENT, SOCIO-ECONOMIC CONDITIONS & OCCUPATIONAL HEALTH PROBLEMS OF BALUCHARI SHARI WEAVERS OF BISHNUPUR

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#### ABSTRACT

Baluchari Shari is a type of graceful handloom garment that has a long tradition of excellence and unique craftsmanship. The ethnicity, emblematic design and exceptional colour combination depicting mythological folk-tales, rural life styles bear international repute. Though this handloom product is enjoying a ready market both at home and abroad, there are some grey areas demanding immediate attention to sustain and further improve the weaving industry. An effort has been taken to study the nutritional status, socio-economic background and occupational health problems of the Baluchari Shari weavers of Bishnupur. Handloom weavers numbering 62 in the age group of 17-75 years who were willing to co-operate for the study were selected by convenient sampling method. The assessment of nutritional status revealed high prevalence of malnutrition (53.22 %) among Baluchari Shari weavers. The age-wise distribution of the weavers divulged that majority (56 %) of the males belonged to the age group of 18-35 years while most (33.33 %) of the female were in the middle-age group of 36-45 years. This weaving society was mostly dominated by males (80.65 %). Joint family (77.4 %) type still prevails in the weavers' community in which 67.74 % were medium in size. Expertise workers (40.33 %) who had experience of jacquard weaving for more than 2 decades were predominant in the population. Further, it was observed that majority (77.42 %) of the weavers were engaged in weaving activity for 8 hours a day. The literacy rate among Baluchari workers was 72.58 %. The economic profile disclosed that the average monthly household income (Rs. 3620) and standard of living of the handloom weavers were miserable. The musculoskeletal pain, dimness of vision and abdominal discomfort were reported in 46.88, 21.87 & 25 percent of cases respectively. Another serious complication of the weavers was the prevalence of fungal infection (6.25 %) and resultant intrusive black spot on belly.

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## INTRODUCTION

Temple town Bishnupur has a rich cultural heritage of handloom industry and handicraft. It is world famous for terracotta temples and for most beautiful and exquisite hand-spun and hand-woven textiles. Once, Bishnupur was the capital of Malla dynasty and different kinds of crafts flourished under the patronage of Malla kings. Baluchari Shari weaving was also introduced to Bishnupur during this era. Baluchari Shari is a type of graceful garment worn by women across the world. It reflects the mythological folk-tale, pastoral life style of rural India. In the eighteenth century, Murshidkuli Khan, Nawab of Bengal patronized its rich weaving tradition and brought the craft of making this shari from Dhaka to the

Baluchar village of Murshidabad district, from where it got the name Baluchari. Due to sudden flood in Bhagirathi river and subsequent submerging of the Baluchar village, the industry eventually moved to Bishnupur during the reign of the Malla dynasty. Initially, it prospered under the assistance of Malla kings but this flourishing trend later declined, especially during British rule, due to political and financial crisis and it became a dying craft. After independence, around 1956, two well known Bengali personalities Shri Subho Thakur and Kamala Devi Chattopadhyay felt the need of recultivating the rich tradition of Baluchari craft. They insisted master weavers of Bishnupur: Akshay Kumar Das and Gorachand Dasi, who then learn the technique of jacquard weaving and worked hard to reinstate the tradition (Government of India, 2011).

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This Baluchari Shari of Bishnupur is labour intensive, tradition oriented, having a legacy of unrivalled craftsmanship with a

decentralized set-up. It is estimated that around 3000 people (4.5 % of the total population) are involved in Baluchari Shari weaving. The sector is presently beset with various problems, such as rising manufacturing prices of the silk products, transport of raw material from outside, inadequate working capital, weak marketing strategy, low wages of the hard working weavers and above all, competitive global market.

Nutritional deficiency is another common concern of this community. The intensive workload further worsens the situation. National Family Health Survey (NFHS, 2005) data on nutritional status of adult men and women revealed the prevalence of under nutrition among adults in rural areas. The underdeveloped socio-economic condition and lack of public health concern make their situation more vulnerable. Occupational health hazards are another serious concern of weaving industry. Headache, blurring of vision, musculoskeletal pain, abdominal discomfort and respiratory tract infections have been found to be more prevalent in weaving sector (Mattoo *et al.*, 1986).

There were no such studies on the socio economic, nutritional and occupational health status of the handloom weavers of Bishnupur town and hence this study on Baluchari Shari weavers of Bishnupur was undertaken with the following objectives to

- Assess the nutritional status of the weavers
- Study the socioeconomic condition of the weavers
- Evaluate the occupational health problems of the weavers

## MATERIALS AND METHODS

### Study Area

Bishnupur, a place of crafts and culture, is located at an average elevation of 59 m above mean sea level. It is situated at 23°05'N Latitude and 87°19'E Longitude (Archaeological Survey of India). The town, with a population of 67,783 (Census, 2011) has a rich historical past with plentiful natural inheritance, being also the capital of malla dynasty and a tentative site of UNESCO world heritage (UNESCO). Based on the maximum availability of Baluchari Shari weavers, Bagan para of Bishnupur town was selected for the study. Handloom weavers numbering 62 in the age group of 17-75 years who were willing to co-operate for the study were selected from the places by convenient sampling method.

### Collection of Data

The present study is mostly based on primary data sources. Primary data was collected through a survey in the study area during the year of 2015. Handloom weavers numbering 62 were selected as respondents by convenient sampling method. Secondary data was collected from different books, magazines and publications of various government agencies. The statistical analysis of data was carried out using Microsoft Office Excel software.

### Assessment of nutritional status

Anthropometry is the most convenient, easily applied, inexpensive and non-invasive method of assessing body

composition that reflects both health and nutrition (Ismail *et al.*, 1995). It is the measurement of human body parts and sites at different ages to assess the nutritional status (Rao, 2000). Measurement of nutritional status is valuable as it may indicate the health of the community. Anthropometric study of all the respondents was thoroughly executed.

### Height

The height of an individual may get influenced by genetic and environmental factors. Insufficient dietary uptake, irregular eating habits and certain diseases can result nutritional growth retardation (Usharani and Lakshmi, 2014). Height is often affected by long-term nutritional deprivation and is regarded as an index of malnutrition (NIN, 2009). Height was measured using a vertical measuring rod with headpiece without wearing footwear. The respondents were made to stand on flat surface, heels together and head positioned so that the line of vision was at right angles to the body. The arms hang freely by the side and head back. Buttocks and heels are in contact with vertical measuring rods. The individuals were asked to take breaths in deeply and maintain a fully erect position. The movable headpieces brought onto the topmost point on the head with sufficient pressure to compress the hair. In this way successive measurements was taken, final measurement are recorded to the nearest of 0.1cm.

### Weight

Body weight is the most widely used reliable method to assess the growth and development of an individual (NIN, 2009). It also provides a crude evaluation of overall stored fat and muscle (Brahman, 2005). Human weighing balance was used to measure the body weight of the respondents. Zero error of the scale was checked, the scale is then calibrated and measurements were done under basal conditions. The respondents were made to stand on the platform of the balance without shoes and with normal clothing and weights were recorded nearest to the 0.5Kg.

### Body Mass Index (BMI)

Body Mass Index (BMI) or Quetelet's Index is a widely used parameter for estimating body fat mass and an accurate reflection of body fat percentage (Umaito, 2006; Keys *et al.*, 1972). BMI provides a simple numeric measure of a person's thickness or thinness that is commonly used to classify underweight, overweight and obesity among adults (WHO, 2015). The formula  $\text{Weight (kg)} / \text{Height (m}^2\text{)}$  was used to calculate Body Mass Index (BMI). WHO Expert Committee recommended the use of BMI for the determination of the nutritional status of the population. It was designed to be used as a simple means of classifying average sedentary populations (WHO, 1995). BMI values of the selected adult handloom weavers were determined and were precisely categorized.

### Conduct of socio economic survey

Selection of sample & preparation of questionnaire are the most critical part of the research. It defines the whole process; it guides the arguments and provokes the interest of the

respondents. A schedule is a form that includes some questions or blank tables to be filled by the research investigator after getting information from the respondents. A schedule containing standardized questionnaire was developed by the researchers that have direct relevance to the society. The selected respondents were interviewed to collect information on the socioeconomic back ground of the weavers relating to age, sex, education, marital status, income of the family, nature of the family, number of family members etc.

### Evaluation of the occupational health hazards

Standardized questionnaire pertaining to age, working hours, health status of the respondents were investigated. They were interrogated to know whether they suffer any health problems, including headache, cough, diarrhea, respiratory trouble, musculoskeletal pain or vision disorder.

## RESULT AND DISCUSSION

### Anthropometric Measurements

The Body Mass Index (BMI), estimated from the height and weight measurements of individuals, is a widely accepted measure of nutritional status. Based on the BMI, respondents were classified as underweight, normal, overweight and obese. In the present study (Table 1), Out of the total 62 respondents, 53.22 % of the weavers were in the underweight ( $BMI \leq 18.5$ ) category. Among them, 45.46 % were severely thin, 18.18 % were moderately thin and 36.36 % were with mild thinness. 43.55 % of the Baluchari Shari weavers were with normal nutritional status. Only 3.23 percent weavers were overweight and nobody was found as obese. The mean height, weight and BMI of the population were 1.59 m, 48.03 Kg and 19.06 respectively (Table 2).

The prevalence of malnutrition may be due to the inadequate diet, unrest, unhygienic working condition, poor ergonomics, rigorous workload and lack of public health concern.

### Age

As a prelude to an analytical study of the Baluchari Shari weavers of Bishnupur, a survey on the age distribution of the sample was performed. It is useful to determine the proportion of work force in total weavers. The present study (Table 3) showed that, adult ( $18 \geq$ ) handloom weavers account for 98.39 % whereas under-age workers ( $< 18$  years) constituted only 1.61 % of the total workforce. The age-wise distribution of the weavers also revealed that majority (56 %) of the males belonged to the age group of 18-35 years while most (33.33 %) of the female were in the middle-age group of 36-45 years (Figure 1). Weavers above 60 years of age comprised of 4.84 % of the community. Among the 62 respondents surveyed, a majority (50 %) of the population corresponded to the age-group of 18-35 years as the efficiency is relatively higher at this age due to their agility & physical fitness.

### Gender

Weaving is one of the activities which provide the scope of women participation. The Third National Handloom Census (2011) data disclosed that women constituted 77.9 % of the weaving community. However, the gender-wise distribution (Table 4) of Baluchari Shari weavers of Bishnupur revealed that a majority (80.65 %) of the population was represented by males. This discrepancy may be due to the intricate jacquard weaving technique, strenuous workload and intense demand of production. Moreover, women had to accomplish household responsibilities except the professional demand of their job.

**Table 1. The International Classification of adult underweight, overweight and obesity according to BMI**

S. No.	Classification	BMI (Kg/m <sup>2</sup> ) Principal cut-off points	Number of Respondents	Percentage
1.	Underweight	$<18.50$	33	53.22
	Severe thinness	$<16.00$	15	45.46
	Moderate thinness	16.00 - 16.99	06	18.18
	Mild thinness	17.00 - 18.49	12	36.36
2.	Normal range	18.50 - 24.99	27	43.55
	Overweight	$\geq 25.00$		
3.	Pre-obese	25.00 - 29.99	02	03.23
	Obese	$\geq 30.00$		
4.	Obese class I	30.00 - 34.99		
	Obese class II	35.00 - 39.99		
	Obese class III	$\geq 40.00$		
Total			62	100

Source: Adapted from WHO, 1995, WHO, 2000 and WHO 2004.

**Table 2. The Statistical Assessment of Anthropometric Measurements**

Height (m)		Weight (Kg)		BMI	
Mean	1.586774	Mean	48.03226	Mean	19.060645
Standard Error	0.01405	Standard Error	1.212261	Standard Error	0.4504082
Median	1.6	Median	49	Median	18.31
Mode	1.65	Mode	50	Mode	15.51
Standard Deviation	0.110628	Standard Deviation	9.545349	Standard Deviation	3.5465175
Sample Variance	0.012239	Sample Variance	91.1137	Sample Variance	12.577786
Kurtosis	2.315202	Kurtosis	1.508178	Kurtosis	-0.6174354
Skewness	-1.40334	Skewness	0.374167	Skewness	0.3263273
Range	0.53	Range	54	Range	15.12
Minimum	1.22	Minimum	26	Minimum	12.56
Maximum	1.75	Maximum	80	Maximum	27.68
Sum	98.38	Sum	2978	Sum	1181.76
Count	62	Count	62	Count	62
Confidence Level (95.0%)	0.028094	Confidence Level (95.0%)	2.424065	Confidence Level (95.0%)	0.9006468

Source: Microsoft Office Excel Worksheet

**Table 3. The Age-wise distribution of Baluchari weavers of Bishnupur**

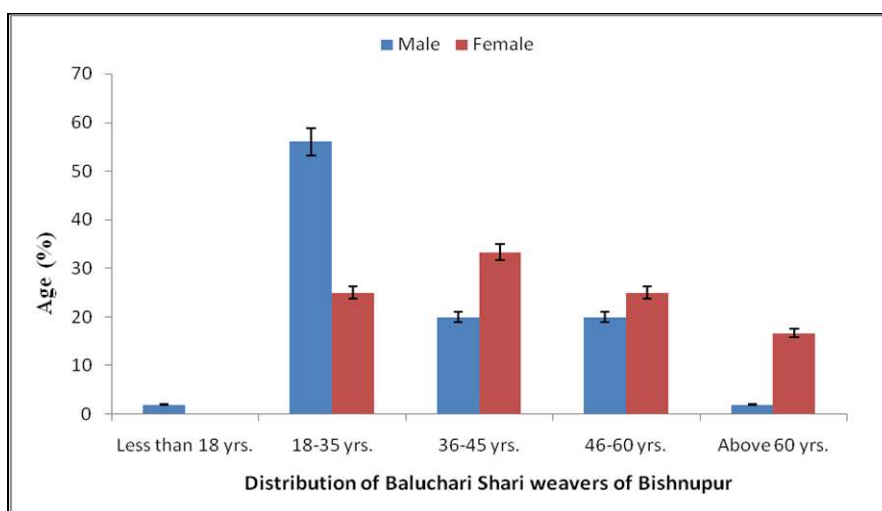
S.No.	Age Group	Number of Respondents				Total Percentage
		Male	Percentage	Female	Percentage	
1.	Less than 18 years	01	2	--	--	01.61
2.	18-35 years	28	56	03	25.00	50.00
3.	36-45 years	10	20	04	33.33	22.58
4.	46-60 years	10	20	03	25.00	20.97
5.	Above 60 years	01	2	02	16.67	04.84
	Total	50	100	12	100	100

Source: Primary data

**Table 4. Gender-wise distribution of Baluchari weavers of Bishnupur**

S. No.	Gender	Number of Respondents	Percentage
1.	Male	50	80.65
2.	Female	12	19.35
	Total	62	100

Source: Primary data



**Figure 1. The Age-wise (%) distribution of Baluchari weavers of Bishnupur**

**Table 5. Family Status of Respondents**

S.No.	Family Type	Number of Respondents	Percentage
1.	Nuclear	14	22.58
2.	Joint	48	77.42
	Total	62	100
	Family Size		
1.	Small (Up to 3)	14	22.58
2.	Medium (4-6)	42	67.74
3.	Large (More than 6)	06	09.68
	Total	62	100

Source: Primary data

**Table 6. Marital Status of Respondents**

S.No.	Marital Status	Number of Respondents	Percentage
1.	Married	46	74.19
2.	Unmarried	16	25.81
	Total	62	100

Source: Primary data

**Table 7. Working Status of Respondents**

Sl. No.	Experience-wise Working Status	Number of Respondents	Percentage
1.	< 5 years	--	--
2.	5-10 years	16	25.80
3.	11-20 years	21	33.87
4.	> 20 years	25	40.33
	Total	62	100
Sl. No.	Day-wise Working Hours	Number of Respondents	Percentage
1.	Up to 8 hours	48	77.42
2.	9-10 hours	02	03.23
3.	11-15 hours	12	19.35
	Total	62	100

Source: Primary data

## Family Type and Size

Nature of the family is one of the demographic indicators of a population. Family type and size contributes significantly to the gross family income. The results (Table 5) of the present study indicated that joint family (77.4 %) still prevails in the weavers' community in which 67.74 % were medium in size. Only 9.68 % of the population lived in a large family system. Nuclear families tend to had small family size (22.58 %). This finding was in discordance with the statement of the year book of India (2000) where 82 % of the families were reported to be of nuclear type. The weaving occupation is one of such profession which involves all family members who contribute their precious service in pre-weaving, weaving and post-weaving processes.

## Marital Status & Size

The data relating to the marital status of the respondents were also collected and analyzed (Table 6) during the survey. It revealed that 46 respondents (74.19 %) were married while rest of 16 (25.81 %) were un-married among the weavers of Bishnupur. In this weaving community marriage usually takes place in young age itself, therefore the percentage of married respondents is greater than that of unmarried respondents.

## Working Status

Experience is the fundament of success. Any qualitative work depends on dedicated, honest, efficient & experienced workforce. The investigation (Table 7) revealed that, weaving community was dominated (40.33 %) by expertise workers who had experience of jacquard weaving for more than 2 decades. 25.80 % and 33.87 % of Baluchari Shari workers possessed 5-10 and 11-20 years of working experience respectively. Further, it was revealed that majority (77.42 %) of the weavers were engaged in weaving for up to 8 hours a day, while only 3.23 % worked for 9-10 hours and 19.35 % of the population were engaged in 11-15 hours per day.

## Educational Status of the weavers

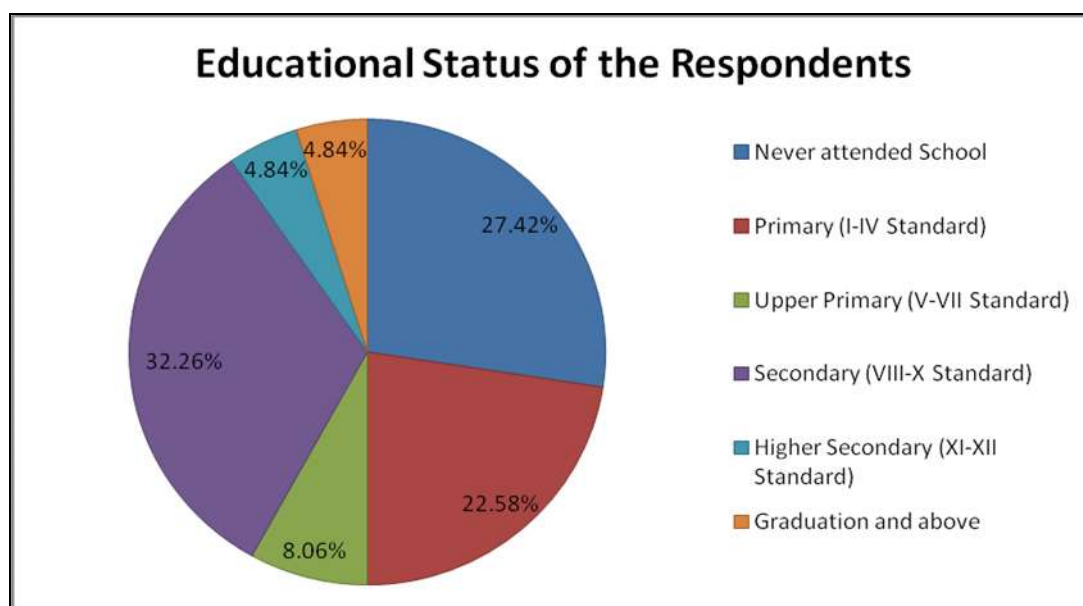
Education provides strength and resilience to enable people to respond to the changing needs of the hour (A P J. Abdul Kalam, 2005). It is the most important prerequisite in improving the technical skills of weavers. The present investigation (Figure 2) revealed that, 27.42 % of Baluchari workers have never attended school, 22.58 % have completed primary education and 8.06 % attended middle school. It also illustrated that a majority (32.26 %) of the Baluchari Shari weavers had completed secondary education which is much higher in comparison to the 10.2 % of national level data (National Handloom Census, 2010). A lesser percentage (4.84 %) of population studied higher secondary and remaining 4.84 % weavers pursued graduation.

## Economic Status of the Baluchari weavers

Income plays a significant role in determining the standard of living of people. The economic profile (Table 8 & Figure 3) of the Baluchari weavers revealed that most of them (61.29 %) belonged to the monthly income category of Rs. 2001-4000. This category was dominated by wage weavers. Master weavers, constituting only 17.74 % of the community were earning little more than 6000 per month. Women represent a major workforce in the handloom sector. They usually lack direct access to wages since weaving is a household enterprise. This shows that the average monthly household income (Rs. 3620) and living standard of the handloom weavers were very poor though this represented somewhat better picture than the state-wise (Rs. 2245) or national level household income (Rs. 3142) of handloom weavers (National Handloom Census, 2010).

## Occupational Health Hazards

An occupational disease is any chronic ailment contracted primarily as a result of an exposure to risk factors arising from work activity (WHO).



Source: Primary data

Figure 2. Educational Status of Baluchari weavers of Bishnupur

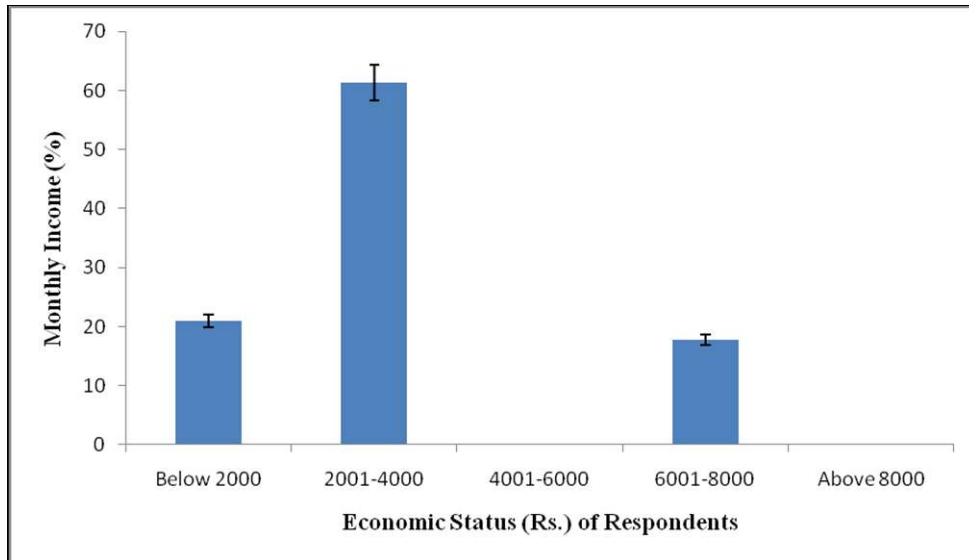


Figure 3. Economic Status of the Baluchari weavers of Bishnupur

Table 8. Economic Status of the families of the Baluchari weavers

Sl. No.	Monthly Income Range	Number of Respondents	Percentage
1.	Below 2000	13	20.97
2.	2001-4000	38	61.29
3.	4001-6000	--	
4.	6001-8000	11	17.74
5.	Above 8000	--	
	Total	62	100

Source: Primary data

Table 9. Major Occupational Health Ailments

S. No.	Nature of Ailments	Number of Cases	Percentage of Cases
1.	Vision disorder	21	21.87
2.	Musculoskeletal pain	45	46.88
	Back pain	11	11.46
	Knee pain	16	16.67
	Joint pain	18	18.75
3.	Abdominal discomfort	24	25.00
4.	Black spot on belly	06	06.25
5.	Respiratory Trouble	--	
	Total	96	100

Source: Primary data

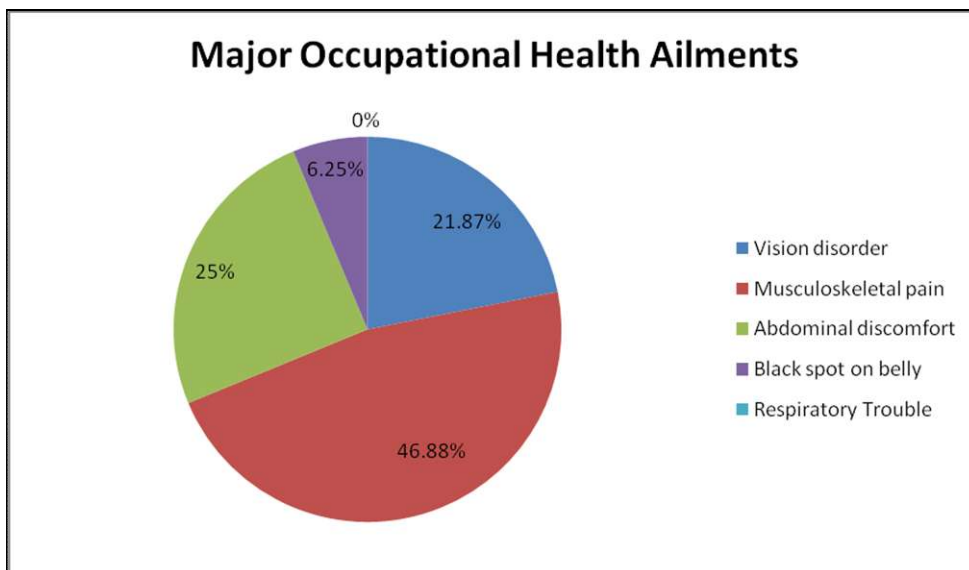


Figure 4. Major Health Ailments of the Baluchari weavers of Bishnupur

It was estimated that each day an average of 137 persons die from occupational diseases and an additional 17 die from injuries throughout the world (CDC, 1996). Occupational health hazards are becoming a serious concern of weaving industry. Generally, weaving communities have poorly ventilated and inadequately lighted rooms. Weavers have to work under unhygienic conditions leading to health problems. The major health ailments (Table 9 & Figure 4) of Baluchari Shari weavers was musculoskeletal pain including back pain (11.46 %), knee pain (16.67 %) and joint pain (18.75 %) owing to odd squatting position & highly-intensive workload.

Among the clinical symptoms dimness of vision and abdominal discomfort were reported in 21.87 & 25 percent of cases respectively. Another serious complication of the weavers was the prevalence of fungal infection (6.25 %) and resultant intrusive black spot on belly (Figure 5). However, no case of respiratory trouble was reported. The majorities of the problems were due to poor ergonomics, improper work station design, long hours of static working condition and inadequate diet of the weavers.



Figure 5. Occupational Health Ailments of the Baluchari weavers of Bishnupur

## Conclusion

The traditional Baluchari Shari weaving has been kept alive by those professionally skilled household weavers, which inextricably is linked with the age-old tradition of weaving. The study presents a historical account of the Baluchari Shari weaving community with a view to identify the factors leading to its decline. It also attempts to focus on aspects of the socio economic conditions of handloom weavers. In addition, the nutritional status and occupational health issues of the industry had also been dealt with. The findings of this study have considerable relevance to evaluate the socioeconomic conditions and standard of living of the handloom weavers. The educational status and literacy rate among the weavers were quiet encouraging. Provision for raw materials at reasonable price, special training, acquaintance about scientific and low cost techniques of weaving, financial assistance, proper diet, regular health check-up and increase of public concern are the need of the day as expressed by the weavers.

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