Dr. Murari Mohan Mandal
Assistant professor,
Department of Community
Medicine, Institute of Post-
Graduate Medical Education &
Research IPGME & R, Kolkata
West Bengal, India

Dr. Abhishek De
Demonstrator, Department of
Community Medicine,
Institute of Post-Graduate
Medical Education & Research
IPGME & R, Kolkata West
Bengal, India

Dr. Saibendu Kumar Lahiri
Professor and Head,
Department of Community
Medicine, RG Kar Medical
College, Kolkata West Bengal,
India

Socio-demographic correlates of morbidity in zari workers of rural West Bengal

Dr. Murari Mohan Mandal, Dr. Abhishek De and Dr. Saibendu Kumar Lahiri

Abstract
Context: "Occupational diseases" are an important determinant of the health of workers. Zari embroidery, though an ancient art form, has suddenly bloomed commercially because of increased consumerism and easy availability of finished goods, both retail and online. Trade in zari accounts for billions annually, and a large proportion of the rural unorganized workforce is engaged in it; yet the unique health problems arising out of such an occupation remains largely unexplored.
Aims: To investigate the socio-demographic correlates of morbidity among rural zari workers.
Settings and Design: population-based cross-sectional study. One village purposively selected from a randomly selected community development block of West Bengal. Sampling done purposively by sequentially enlisting all workers fulfilling eligibility criteria.
Methods and Material: pre-tested, pre-designed structured interview format was used to collect socio-demographic information and questions on work environment and health morbidity. Informed consent was obtained in writing from willing participants. Standard Clinical examinations performed.
Statistical analysis used: Pearson's Chi-squared test and Odds Ratio for exploring associations between variables.
Results: One-fifth of workers never visited school. Mean age of starting Zari work was 14.04 years. Mean age of workers classified as child labour (10.16 years) was significantly less than that of non-child labour (14.72 years; p<0.0001).Nearly half of the population (47.50%) worked for more than eight hours a day. Religious beliefs had a significant association with starting zari work below the permissible age. Almost two-thirds (66.3%) of study subjects had at least one addiction. Specific addictions significantly associated with gender were smoking (p<0.00001) and alcohol use (p<0.00001).
Of all addicted Zari workers, 22% were minors. 239 workers (72.60%) had some sort of illness. Presence of illness was significantly associated with religious beliefs and age at starting of the job. Most workers were suffering from Anemia, Hypertension, Obesity, eye and musculoskeletal problems.
Conclusions: Considerable burden of health morbidity among *zari* workers. Health problems were multiple and related to religious beliefs and age of starting work. Addictions were widely prevalent and some were significantly associated with gender. Prevelance of musculo-skeletal problems were related to duration of work in the industry.

Keywords: zari workers, morbidity, addiction. medical records, musculo-skeletal, occupational diseases

1. Introduction
Occupation is one of the determinants of health and diseases arising out of or in the course of employment are called "Occupational diseases". The spectrum of industries in India extends from the organized large and medium industries to modern small scale industries and unorganized traditional industries. The last two industries are known as village and small industries (VSI). Both of them constitute a vital segment of our country's economy. Zari embroidery, which involves artistic embellishment of apparel with metallic fiber or other ornamental material [1] is an occupation which comes under the unorganized sector. It is an ancient art in this country but was limited to only few specialist artisans till recently. In recent times, there has been an explosion in the demand for this kind of work due to the easy availability of clothes, both on the Internet as well as in brick- and -mortar stores. The work is either home-based, mainly confined within family members or in a small workshop type setup.

Correspondence
Dr. Abhishek De
Demonstrator, Department of
Community Medicine,
Institute of Post-Graduate
Medical Education & Research
IPGME & R, Kolkata West
Bengal, India

At present, goods of more than billions of rupees are traded annually through this industry and it is the fourth largest cottage industry after agricultural work, weaving work and bidi industry.

The health hazards involved in it are uniquely different from the other industries where heavy machinery or dangerous chemicals are involved. Morbidities seen among *zari* workers has been attributed to their low educational level, poor social status, meagre payment, long working hours, poor lighting and ventilation, continuous and awkward postures and lack of integrated systems for periodic health checkup. Little has been published about the known or suspected health risks of zari workers, despite the fact that it involves a large human resource and is a strong stakeholder in the indigenous manufacturing economy. The present study was carried out to assess the socio-demographic profile of zari workers in relation to morbidity experienced by them.

2. Subjects and Methods

2.1. Study Type & Design: Observational, Cross- sectional descriptive study.

2.2. Study duration: October-December'2012

2.3. Study setting: Mohanpur village of Mograhat II Community Development Block, South 24 Parganas

2.4. Study population: All Zari workers of village Mohanpur [2283]

2.5. Sample size and sampling design: Assuming 50% prevalence rate of presence of any morbidity among the study population and considering 95% confidence limits, absolute precision of 5%,and applying finite population correction, the sample size of 329 were calculated as per the formula $n_c = Z^2 pq/e^2 * \sqrt{N-n}/N-1$, where Z=1.96,p=50,q=100-p=50,e=5,N=2283,n=calculated initial sample size as per the formula $Z^2 pq/e^2$. As the initial estimated sample size x10 is more than the total target population the fpc (finite population correction) was adopted.

Mohanpur village was chosen purposively. After obtaining approval from the Institutional Ethics Committee, the village was surveyed for enumeration of all families and family members engaged in Zari work. Among 4,763 villagers, total number of Zari-workers was 2,283. All the workers were enumerated and enlisted worker was given a unique enlistment number (ABC/pqrs) where "ABC" denoted their respective family number (to locate the family in future) and "pqrs" (Range 0001-2283) denoted their serial number. Using Random number generation formula within the range, random numbers were generated and each random number was considered as serial number (pqrs) of the Zari workers and they were included in the study sequentially, after obtaining a written consent and the process continued till 329 study subjects were selected for interview and clinical examination.

2.6. Inclusion criteria:
1. Resident in the local area and involved in zari work for at least one year preceding the study,
2. Average daily working hours of a minimum of four hours.
3. Agreed to participate in the study.

2.7. Exclusion criteria:
1. Suffering from any other already diagnosed chronic illness (es) e.g. DM, Cancer etc.

2.8. Study tools
1. Predesigned and pretested schedule for interview. Format for clinical examination and record review.
2. Equipment for clinical examination viz.- stethoscope, blood pressure measuring instrument (electronic type), weight machine (electronic type), simple measuring tape (non-stretchable), six meter long rope with hooks (jute made), Snellen's distant vision chart (Picture type), FAA NVTC near vision chart (LEA Symbol type), tuning fork, dry cell torch, tongue depressor, hammer, pin and cotton

2.9. Study technique: Interview of the study subjects, clinical examination. Examination of female subjects were done in presence of a female person as attendant. However, examination of private parts was not done. Scrutiny of the available relevant medical records was carried out.

2.10. Study procedure: Data collection was started after obtaining ethical permission as well as written consent from the study subjects. Information pertaining to demographic and socio-economic status were obtained by interview using the predesigned and pretested schedule. Data obtained from clinical examination and record review were documented in a format. Few medicines for some emergency conditions were supplied and in other cases prescriptions were served along with referral, as and when necessary.

2.11. Statistical frame work: The collected data were compiled in MS Excel spreadsheet to prepare a master chart, then were presented using different statistical methods like tables and diagrams. For descriptive statistics mean, median, range, standard deviation, simple proportion etc. were calculated and to draw inference, tests of significance e.g. Chi square test, Fisher exact test, Odds ratio with 95% Confidence Interval (CI), For analysis, SPSS Version 21 and Epi Info Version 7.0 were used.

2.12. Operational Definitions
- **Zari Worker:** Person engaged in manufacturing of garments using various raw material by any of following method e.g. cutting, sewing, embroidery of any type and dyeing. Trader of Zari material either raw material or finished product is not considered as worker.
- **Education:** Illiterate- did not attend school, primary-attended class 1 to class 4, lower middle- attended class 5 to 8, upper middle- attended class 9-10, higher secondary- attended class 11-12, graduate and above-completed graduation and higher.
- **SES**: B G Prasad scale (Updated for 2013AIWPI)
- **Smoking:** Smokes (Bidi, Cigarette, Huccah or Canabis) currently or smoked last within past one year.
- **Chewing Tobacco:** Any form of tobacco product that is taken by mouth or inhaled through nose in solid/liquid form (Current active user or last used within past one year).
- **Drinks:** Drinks any amount more than twice in a week (current user).

- **BMI:** As per South East Asia region Classification system.
- **Blood Pressure:** As per JNC 7 classification (Also applied for non-adult).
- **Vision:** Normal is defined as at least 6/9 distant vision in better eye with maximum available correction.
- **Conjunctivitis:** Redness of the eye and inner surface of eyelids with discharge.
- **GI problems:** Includes APD, GERD, constipation, diarrhea, dysentery, gall bladder stone, hepatitis etc.
- **Anemia:** Presence of pallor in lower palpebral conjunctiva/tongue/nail bed/palm
- **Neurological Problems:** Loss of touch, pain, vibration and two-point discrimination sense; presence of tremor etc.
- **Dermatological Problems:** Paronychia, pitaryasis, ring worm, scabies, minor injury etc.
- **Musculoskeletal problem:** Low back pain, stiff neck, stiff shoulder and any type of joint involvement.

3. Results

Age of the workers was between 5 and 47 years with Mean age of 28.16(28.16-29.36) years. as a whole and mean age of 27.51±0.877 years (SD-11.095) for male & 28.77±0.825 years (SD-11.078) for female. Almost entire (92.70%) workers were between 10 to 44 years age group (Table-1). Involvement of children (5 to 14 years) in zari work as compared to adults was significantly more with an adult-child (5 to 14 years) ratio of 100:571 as compared to a ratio of 100:356 for the village population (OR 0.6235, p<0.005). Girls were more involved than boys (100:471 for boys and 100:705 for Female; p<0.001).

There was female predominance with ratio of 1058 female per 1000 males. In the overall village population, the ratio was 987 women per 1000 men. (Table-1).

One-fifth of total workers (20.10%) never visited any school and nearly half (42.30%) of the total school goers (79.90%) left school before reaching Upper Primary Level of formal education (Table-1). Girls were less likely to discontinue their education after completion of Lower Middle school education than boys (OR 0.710, p≤0.05). More than half of the subjects had completed at least higher secondary level of education (51.9%)

Almost two-third (65.60%) of the workers were below Socio-Economic class III (Table-1). Half of the workers (51.70) were engaged in the job for more than 10 years (Table-1). Mean per capita income (MPCI) was Rs.1423.40+SD 1030.0). MPCI among male workers was INR 1478.60±112.20 (SD-938.40) and among female workers was INR 1378±98.60 (SD-1098.20).

All study subjects were home-based workers. They were not found to have registered under any labour organization/work force union/trade union.

Mean age at starting of Zari work as a whole was 14.04 years (13.56-14.52 years, SD-4.395). The mean age of joining work gradually and significantly decreased over time i.e. the younger the working population was, the earlier they were engaged in the job (Table-2). Mean age of workers classified as child labour (10.16 years) was also significantly less than that of non-child labour (14.72 years; p<0.0001). Similar findings were noted across gender

variation (14.59 years among women and 13.46 years among men; p<0.019) and religious belief (12.21 years for Muslims and 16.36 years for Hindus; p<0.005). There were no significant variations in mean age of joining with present educational level or socio-economic status (Table-2). Mean duration of engagement in Zari work was 14.12 years with Median of 14 years (SD-10.09).Other important occupation apart from their main job was agriculture during harvesting seasons; women workers were also engaged in house work. The workers were engaged in this job for 4 to 14 hours daily with median of 8 hours and a mean of 8.6 (8.26-8.94) hours (SD-3.130). Nearly half of the population (47.50%) had to work for more than eight hours a day. There was no significant variation in daily working hours across the age groups of the workers and gender, though females were apparently more engaged in the Zari work on the basis of average hours per day work (Table-3). Similarly, religious belief, socio-economic status and educational level were not significantly associated with duration of working hours. However, religious beliefs had a significant association with starting zari work below the permissible age (Table-4). The workers didn't enjoy weekly off-days or scheduled holidays.

Addiction: Addiction was rampant among zari workers. Almost two-thirds (66.3%) of study subjects had at least one addiction. Noteworthy addictions were smoking, chewing of tobacco and consumption of alcohol. Gender was found to be significantly associated with presence of addiction (p<0.000001). Specific addictions significantly associated with gender were smoking (p<0.00001) and alcohol use (p<0.00001). (Table-5).

Of all addicted Zari workers, 22.00% were minor and of all female workers 21.20% were minor. Association between being a minor and gender among subjects with any addiction was not significant (Table-6)

Morbidity pattern: After a detailed clinical examination, it was found that 239 people (72.60%) had some sort of illness. Presence of illness was significantly associated with the religious belief and age at starting of the job (Table-7). Ailments common among Zari workers were anemia (60.80%), abnormal blood pressure- JNC 7 category II and higher (17.00%), malnutrition –chronic energy deficiency syndrome and obesity (27.00%), eye problems (30.70%), musculoskeletal problems (28.00%), gastro-intestinal problems (11.90%) and neurological problems (3.60%) (Table 8). Gender was significantly associated with BMI (p<0.000001) and presence of clinical anemia (p=0.02). Most of the zari workers were suffering from musculoskeletal disorders, with lower and upper backache being most common, followed by pain in legs. The reason for this was prolonged awkward bending posture, which increases risk of back and knee problems. Musculoskeletal problems were observed to be compounded as the years in the current job increases, with more people falling prey to low backache, upper backache, pain in legs and arms. Tingling and numbness was also found in all individuals who had 30 years or more of job experience in their present job. This is primarily because of the fact thatzari workers were occupied for about 12 hours continuously in the same, awkward sitting posture.

Table 1: Distribution of Zari workers by different socio-demographic characteristics and gender (n=329).

Socio-demographic characteristics	Gender		Total No. (%)
	Female No. (%)	Male No. (%)	
Age (yrs.)			
5-14	21 (6.40)	28(8.50)	49(14.9)
15-19	20 (6.10)	20 (6.10)	40 (12.20)
20-44	114(34.6)	102(31.0)	216(65.6)
45+	14 (4.30)	10 (3.00)	24 (7.30)
Total	169(51.36)	160(48.64)	329(100.0)
Religion			
Muslim	95 (28.90)	89 (27.10)	184 (55.90)
Hindu	74 (22.50)	71 (21.60)	145 (44.10)
Total	169 (51.40)	160 (48.60)	329 (100.00)
Education			
Illiterate	31 (9.40)	35 (10.60)	66 (20.10)
at least Primary	45 (13.70)	25 (7.60)	70 (21.30)b
at least Higher Secondary	82(24.9)	89 (27.05)	171 (51.9)
Graduate and Higher	11 (3.30)	11 (3.30)	22 (6.70)
Total	169 (51.40)	160 (48.60)	329 (100.00)
Socioeconomic status (Modified B G Prasad)			
Class II	5 (1.5)	3 (0.90)	8 (2.40)
Class III	50 (15.20)	55 (16.70)	105 (31.90)
Class IV	61 (18.50)	47 (14.30)	108 (32.80)
Class V	53 (16.10)	55 (16.70)	108 (32.80)
Total	169 (51.40)	160 (48.60)	329 (100.00)
Engaged in this job (Years)			
1-10	80 (24.30)	79 (24.00)	159 (48.30)
11-20	51 (15.50)	41 (12.50)	92 (28.00)
21-30	34 (10.30)	35 (10.60)	69 (21.00)
>30	4 (1.20)	5 (1.50)	9 (2.70)
Total	169 (51.40)	160 (48.60)	329 (100.00)

Table 2: Distribution of participants by their socio-demographic characters (n=329).

		N	Mean $\pm$SD	95%CI		p
Gender	Male	169	14.59$\pm$4.377	0.188	2.083	0.019
	Female	160	13.46$\pm$4.351			
Religion	Muslim	184	12.21$\pm$3.187	-4.996	-3.298	<0.0001
	Hindu	145	16.36$\pm$4.626			
Education	Illiterate	66	14.05$\pm$4.337			
	Primary	70	13.40+4.483			
	Lower Middle	69	13.71$\pm$4.102			0.499b
	Upper Middle	58	14.72$\pm$4.591			
	Higher Secondary	44	14.73$\pm$4.617			
	Graduate/Higher	22	13.91$\pm$4.242			
Child Labour	Yes	49	10.16+1.328	-5.800	-3.309	<0.0001a
	No	280	14.72$\pm$4.393			

a: Independent samples t-test
b: ANOVA

Table 3: Distribution of working hours with socio-demographic variables

Parameters	Working duration		
	$\leq$ 8 Hours No. (%)	> 8 Hours No. (%)	Total No. (%)
Age			
5-9	4(1.20)	0 (0.00)	4 (1.20)
10-14	28(8.51)	17 (5.20)	45 (13.70)
15-19	20 (6.10)	20 (6.10)	40 (12.20)
20-24	19(5.77)	25 (7.60)	44 (13.40)
25-29	22(6.70)	22 (6.70)	44 (13.40)
30-34	25 (6.70)	19 (5.80)	44 (13.40)
35-39	21(6.38)	20 (6.10)	41 (12.50)
40-44	23 (7.00)	20 (6.10)	43 (13.10)
45+	14 (4.25)	10 (3.00)	24 (7.30)
Total	176(53.5)	153 (46.50)	329 (100.00)
Female	74 (22.50)	85 (25.80)	169 (51.40)
Gender			
Male	92 (28.00)	68 (20.70)	
Total	176(53.5)	153 (46.50)	329 (100.00)

Religion			
Muslim	103 (31.30)	81 (24.60)	184 (55.90)
Hindu	73 (22.10)	72 (21.90)	145 (44.10)
Total	176(53.5)	153 (46.50)	329 (100.00)
Illiterate	41(12.46)	66 (20.10)	
Education level			
Primary	31(9.42)	70 (21.30)	
Lower Middle	35 (10.63)	69 (21.00)	
Upper Middle	26 (7.90)	58 (17.60)	
Higher Secondary	24(7.29)	44 (13.40)	
Graduate and Higher	11(3.34)	22 (6.70)	
Total	176(53.59)	329 (100.00)	
Socio-Economic status			
Class II	7 (2.12)	8 (2.40)	
Class III	55(16.71)	105 (31.90)	
Class IV	57 (17.32)	108 (32.80)	
Class V	57(17.32)	108 (32.80)	
Total	176 (53.50)	329 (100.00)	

Table 4: Association of age at joining Zari work with selected socio-demographic variables (n=329)

Parameters	Starting Age more than 14 years		Total No. (%)	χ^2, p	OR (95% CI)
	YES No. (%)	NO No. (%)			
Gender					
Female	72 (21.90)	97 (29.50)	169 (51.40)	2.348, 0.1254	1.4172 (0.907-2.215)
Male	55 (16.70)	105 (31.90)	160 (48.60)		
Total	127 (38.60)	202 (61.40)	329 (100.00)	--------	---------
Religion					
Muslim	38 (11.60)	146 (44.40)	184 (55.90)	56.75, 0.0000	0.1638 (0.111-0.267)
Hindu	89 (27.10)	56 (17.00)	145 (44.10)		
Total	127 (38.60)	202 (61.40)	329 (100.00)	---------	----------
SES					
II	3 (0.90)	5 (1.50)	8 (2.40)	0.1059, 0.744	1.000
III	45 (13.70)	60 (18.20)	105 (31.90)		1.250
IV	35 (10.60)	73 (22.20)	108 (32.80)		0.799
V	44 (13.40)	64 (19.50)	108 (32.80)		1.146
Total	127 (38.60)	202 (61.40)	329 (100.00)	---------	---------

Table 5: Association of addiction status and gender in study subjects (n=329).

Parameters	Gender		Total No. (%)	χ^2, p	OR (95% CI)
	Female No. (%)	Male No. (%)			
Addiction Present					
Yes	85 (25.80)	133 (40.40)	218 (66.30)	39.622, <0.000001	0.2054 (0.2231-0.3428)
No	84 (25.50)	27 (8.20)	111 (33.70)		
Total	169 (51.40)	160 (48.60)	329 (100.00)	--------	----------
Smoking					
Yes	0 (0.00)	89 (27.10)	89 (27.10)	128.867, <0.00001	NA
No	169 (51.40)	71 (21.60)	240 (72.90)		
Total	169 (51.40)	160 (48.60)	329 (100.00)	----------	----------
Tobacco Chewing					
Yes	85 (25.80)	75 (22.80)	160 (48.60)	0.3850, 0.5349	1.1468 (0.7439-1.7680)
No	84 (25.50)	85 (25.80)	169 (51.40)		
Total	169 (51.40)	160 (48.60)	329 (100.00)	----------	-----------
Alcohol use					
Yes	0 (0.00)	38 (11.60)	38 (11.60)	45.3788, <0.00001	NA
No	169 (51.40)	122 (37.10)	291 (88.40)		
Total	169 (51.40)	160 (48.60)	329 (100.00)	-----------	------------

Table 6: Association of age and gender within addicted subjects (n=218).

Minor	Gender		Total No. (%)	χ^2, p	OR (95% CI)
	Female No. (%)	Male No. (%)			
Yes	18 (8.30)	30 (13.80)	48 (22.00)	0.0575, 0.8104	0.9224 (0.4766-1.7853)
No	67 (30.70)	103 (47.20)	170 (78.00)		
Total	85 (39.00)	133 (61.00)	218 (100.00)	-------	

Table 7: Association of selected socio-demographic variables with morbidity (n=239).

Parameters	Morbidity Present		Total No. (%)	OR (95% CI)	χ2(for Trend), p
	Yes No. (%)	No No. (%)			
Age in years					
5-14	31 (9.40)	18 (5.50)	49 (14.90)	1.000	
15-24	65 (19.70)	19 (5.80)	84 (25.50)	1.986	0.37590
25-34	64 (19.40)	24 (7.30)	88 (26.70)	1.548	0.53980
35-44	61 (18.50)	23 (7.00)	84 (25.50)	1.540	
45+	18 (5.40)	6 (1.80)	24 (7.30)	1.742	
Total	239(72.60)	90 (27.40)	329 (100.00)	--------	-------
Child Labour					
Yes	31 (9.40)	18 (5.50)	49 (14.90)	0.5962	2.5486
No	208 (63.30)	72 (21.90)	280 (85.10)	(0.3145-1.1302)	0.11039
Total	239 (72.60)	90 (27.40)	329 (100.00)	-------	------
Gender					
Female	123 (37.30)	46 (14.00)	169 (51.40)	1.0142	0.0033
Male	116 (35.30)	44 (13.40)	160 (48.60)	(0.6245-1.6472)	0.9544
Total	239 (72.60)	90 (27.40)	329 (100.00)	--------	--------
Religion					
Muslim	125 (38.40)	58 (17.60)	183 (55.90)	0.6050	3.9057
Hindu	114 (34.40)	32 (9.70)	146 (44.10)	(0.3667-0.9981)	0.048123
Total	239 (72.60)	90 (27.40)	329 (100.00)	--------	-------
Education					
Illiterate	46 (14.00)	20 (6.10)	66 (20.10)	1.000	
At least Primary	52 (15.70)	18 (5.50)	70 (21.30)	1.401	0.627
At least Higher Secondary	125 (37.9)	46 (13.9)	171(51.8)	1.048	0.498
Graduate and Higher	16 (4.80)	6 (1.80)	22 (6.60)	1.004	
Total	239 (72.60)	90 (27.40)	329 (100.00)	-------	--------
SES					
II	5 (1.50)	3 (0.90)	8 (2.40)	1.000	
III	75 (22.70)	30 (9.10)	105 (31.90)	1.500	0.50152
IV	78 (23.70)	30 (9.10)	108 (32.80)	1.560	0.47883
V	81 (24.70)	27 (8.20)	108 (32.80)	1.800	
Total	239 (72.60)	90 (27.40)	329 (100.00)	-------	-------
Starting age >14 years					
Yes	104 (31.60)	28 (8.50)	127 (38.60)	1.7058	4.1868
No	135 (41.00)	62 (18.80)	202 (61.40)	(1.0199-2.8531)	0.0400
Total	239 (72.60)	90 (27.40)	329 (100.00)	--------	-------
Years of Work					
1-10	114 (34.70)	45 (13.70)	159 (48.30)	1.000	
11-20	70 (21.10)	22 (6.70)	92 (28.00)	1.256	0.09746
21-30	50 (15.20)	19 (5.80)	69 (21.00)	1.039	0.7549
>30	5 (1.50)	4 (1.20)	9 (2.70)	0.493	
Total	239 (72.60)	90 (27.40)	329 (100.00)	-------	------
Daily work less than/or 8 hours					
Yes	124 (37.60)	52 (15.80)	176 (53.50)	0.7880	0.9133
No	115 (35.00)	38 (11.60)	153 (46.50)	(0.4831-1.2852)	0.3392
Total	239 (72.60)	90 (27.40)	329 (100.00)	--------	-------
Addiction					
Yes	161 (48.90)	57 (17.30)	218 (66.30)	1.1950	0.4751
No	78 (23.70)	33 (10.00)	111 (33.70)	(0.7198-1.9838)	0.4906
Total	239 (72.60)	90 (27.40)	329 (100.00)	------	------

Table 8: Association of health parameters with gender (n=239).

Health Parameters	Gender		Total NO. (%)	χ2, p	OR (95% CI)
	Female NO. (%)	Male NO. (%)			
BMI					
CED/underweight	19 (5.80)	38 (11.60)	57 (17.30)		0.301
Normal	118 (35.90)	71 (21.60)	189 (57.40)	7.71, <0.000001	1.000
Overweight	23 (7.00)	28 (8.50)	51 (15.50)		0.494
Obese	9 (2.70)	23 (7.00)	32 (9.70)		0.235
Total	169 (51.40)	160 (48.60)	329 (100.00)	--------	-------
Blood Pressure					
Normal	49 (14.90)	51 (15.50)	100 (30.40)		1.000
Pre-hypertension	89 (27.10)	84 (25.50)	173 (52.60)	0.316, 0.573	1.103
Stage I Hypertension	30 (9.10)	23 (7.00)	53 (16.10)		1.358
Stage II Hypertension	1 (0.30)	2 (0.60)	3 (0.90)		0.520

Total	169 (51.40)	160 (48.60)	329 (100.00)	-------	---------
Clinical Anemia (pallor)					
Present	113 (34.40)	87 (26.40)	200 (60.80)	5.378, 0.020	1.693 (1.083-2.646)
Absent	56 (17.00)	73 (22.20)	129 (39.20)		
Total	169 (51.40)	160 (48.60)	329 (100.00)	--------	----------
Eye Morbidity(ies)					
Conjunctivitis*	37 (11.20)	32 (9.70)	69 (21.000	0.0008, 0.977	1.006 (0.63-1.6089)
Cataract*	0 (0.00)	1 (0.30)	1 (0.30)		
Farsightedness*	9 (2.70)	15 (4.60)	24 (7.30)		
Conjunctivitis and farsightedness*	3 (0.90)	1 (0.30)	4 (1.20)		
Conjunctivitis and cataract*	3 (0.90)	0	3 (0.90)		
Nothing abnormality detected	117 (35.60)	111 (33.70)	228 (69.30)		
Total	169 (51.40)	160 (48.60)	329 (100.00)	--------	---------
Musculoskeletal Morbidity(ies)					
Low Back Pain (LBP)*	26 (7.90)	20 (6.10)	43 (13.10)	0.463, 0.495	0.847 (0.526-1.365)
Neck pain*	11 (3.30)	12 (3.60)	23 (7.00)		
LBP and neck pain*	5 (1.50)	6 (1.80)	11 (3.30)		
Arthritis (joint pain)*	4 (1.20)	11 (3.30)	15 (4.60)		
Nothing Abnormality Detected	123 (37.40)	111 (33.70)	237 (72.00)		
Total	169 (51.40)	160 (48.60)	329 (100.00)	-------	--------
Other Morbidities					
GI Problem	21 (6.40)	18 (5.50)	39 (11.90)	0.109, 0.741	119 (0.567-2.188)
Dermatitis	18 (5.50)	15 (4.60)	33 (10.00)	0.143, 0.700	1.152 (0.559-2.372)
Neurological Problem	5 (1.50)	7 (2.10)	12 (3.60)	0.469, 0.493	0.667 (0.207-2.144)
Respiratory Morbidity (ies)	6 (1.80)	5 (1.50)	11 (3.30)	0.046, 0.830	1.141 (0.341-3.815)

4. Discussion

A Total of 800 zari workers were interviewed, out of whom 77.8% were between age group of 15 to 44 years with mean age of 38.7 years. The bulk of workforce belonged to lower socio-economic class i.e. Class III (32%) and class IV (32.8%). The literacy level was low on the whole, with most (41.4%) workers having completed only primary education. Table 4 outlines associations between selected socio-demographic factors and age of joining zari work: All subjects exceeding 30 years of job experience had low backache problems while 53.8% of those with less than 10 years of job had such problem. Most of the zari workers were suffering from musculoskeletal disorders with lower and upper backache being most common followed by pain in legs. The reason for this was prolonged awkward bending posture, which increases the risk of back and knee problems [3] in a study conducted by Bhatia [4] among zari workers, backache (87.7%) was the chief complaint followed by lacrimation (34.7%) and headache (31.9%). Similar findings were also noted by Punalekar [1] in a study on 500 female zari workers in Gujarat, where back pain was complained by 70% and diminished vision by 74% subjects.

Around two-thirds(66.3%) of the workers had some or other kind of addiction (Table 5),of which 27% were addicted to smoking, either in a cigarette or bidi form, 32.0% and 48% were tobacco and gutkha chewers, and around 12% of them consumed alcohol. In a study on organized workers involved in diamond cutting industry, Mehta et al. [5] found that 48.85% workers had a habit of chewing tobacco. Similar findings were reported by Tiwari et al. [6] and Ladd et al. [7] in studies done on the workers engaged in other unorganized sectors.

Examination findings revealed that 7.5% workers were hypertensive while 63% were anemic (Table 8). Mehta et al. [5] found 6.58% prevalence of hypertension in diamond cutters. Medhi et al. [8] studied the nutritional status of 1,863 male and 2,153 females working in tea garden of Assam and found that prevalence of anemia was 69.9% among the workers.

Musculoskeletal problems increases as the years in current job increases, with more people falling prey to low backache, upper backache, pain in legs and pain in arms. Tingling and numbness was also found in all individuals who had 30 years or more of job experience in their present job. This is primarily because of the fact that zari workers were occupied for about 12 hours continuously in the same awkward sitting posture. Their occupation is burdened with strenuous work and over exertion and it could be the cause of musculoskeletal morbidity. Nordin et al. [9] have also found that over exertion accounts for more than two-thirds of the disorders of musculoskeletal system among industrial workers. This finding has also been found to be a cause of musculoskeletal disorders in studies done by Houtman et al. [10] and Skov et al. [11]

5. References

1. Punalekar SP. Informalisation and Dependency`. A Study of Zari Embroidery Workers in Gujrat` Centre for social studies, South Gujarat University, Surat, 1988.
2. Nag A. Occupational stresses on women engaged in making beedies. Journal of occupational Medicine, 1986, 130:36.
3. PC Ghosh, et al. Occupational Health Profile of the Beedi Workers and Ergonomics Intervention, HNEWS 2005, 3.
4. Bhatia M. Occupational Hazards of Zari Workers in Cheetah Camp, Bombay. University of Bombay, Bombay, 1987.
5. Harshvardhan Mehta H, Ribadiya G. Morbidity profile and treatment pattern among the workers of diamond cutting and polishing industry at Ahmedabad City. Indian J of Practising Doctors. 2008-12; 5(5).
6. Tiwary G, Gangopadhyay PK, Biswas S, Nayak K, Chatterjee MK, Chakraborty D et al. Socioeconomic status of workers of building construction industry. Indian Journal of Occup Environ Med. 16:66-71. Available from: http://www.ijoem.com/text.asap?2012/16/2/66/107072

7. Balkrishna B, Adsul Payal S, Laad Prashant V, Howal Ramesh M, Chaturvedi. Health problems among migrant construction workers: A unique public–private partnership project. Indian J Occup Environ Med. doi: 10.4103/0019-5278.83001. 2011; 15(1):29-32.
8. Medhi GK, Hazarika NC, Shah B, Mahanta J. Health problems and nutritional status of tea garden population of Assam. J. Med. Sci. 2006; 60(12):496-505.
9. Margareta Nordin & Carl Zetterberg. Work related Musculoskeletal Disorders excluding Back Pain. 65: 937-939.
10. Houtman IL, Bongers PM, Smulders PG. Psychological stressors at work and musculoskeletal problems, Scand J. Work Environ. Health. 1994; 20:139-145.
11. Skov T, Borg V, Orhede E. Psychosocial and Physical risk factors for musculoskeletal disorders of the neck, shoulder & lower back in sales people. Occup. Environ Medicine, 1996; 53:352-356.