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A cross-sectional study on Morbidity Pattern among Leather Factory workers at Sripuram, Chennai, Tamil Nadu, India.

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ABSTRACT

Leather workers are commonly affected with various health hazards connected in industries. The main aim is to find out various morbidity patterns among the workers in leather industry. Cross-sectional survey health complaints among 230 workers in 8 different leather factories in Sripuram, Chennai were interviewed using pre tested questionnaire. Socio-demographic profile, Health complaints, General and Physical examination for various health problems were asked. The association between certain factors from socio-demographic profile with morbidities among the leather workers was also assessed. Around 78% of workers were affected with anyone of the above cited health problems. Majority of the workers are affected with Musculo-skeletal disorder(31.7%) and others problems including Skin problem(15.7%), Respiratory problem(16.9%), Eye problem(6.5%), Ear problem(0.4%), Dental problem(2.6%), C.N.S problem(0.4%), C.V.S problem(0.9%), Abdomen problem(2.6%),Uro-Genital problem(0.4%) and also there is association between certain factors like Gender(p value<0.0001), Occupation (p value 0.001), Nourishment(p value <0.0001), past history of illness(p value<0.0001) with the morbidities among the leather workers. The results of the study showed that there is a need to improve the health status and health needs of the workers in the leather industries. Protective measures should also be provided to reduce the various morbidities.

Keywords: morbidity pattern, leather tanneries, health risk, occupational environment impact

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INTRODUCTION

The Origin of leather industry dates back to 3000 B.C. in India. While leather was used for clothing and footwear in ancient days, its use and subsequent leather based products have grown manifold. India is world's fifth largest exporter of leather products and accessories. The Industry gives employment to more than 2.5 million workers, 30% being women. Almost 60-65% of the production is through small scale or Cottage sector. Tamil Nadu is one of the major leather production centers in India, accounting for about 34.8% of total India's exports. There are about 180 leather industries in and around Chromepet and Pallavaram near Chennai, in that 160 tanneries belong to Pallavaram Tannery Association. Most of the industries in this area involve in tanning and dyeing process. It was observed that many labourers hailing from this area were regular visitors to Sree Balaji Medical College Rural Health Centre, which prompted to explore the connection between the industry and the ailments.

The working populations mainly in the tanneries are more prone to exposure of health hazards rather than workers from dyeing and finishing units. Some of the common illnesses are respiratory disorder, naso-oral tract, skin diseases, ocular illness, cardio vascular system related problems, central nervous system related problems, uro-genital system related problems and musculo-skeletal system related problems.

The dust from the leather industries can result in several problems like acute bronchitis, bronchial asthma, even anthrax may be seen among the leather workers. A study at Karachi by Khurram Shahgad, Sacid Akbar & Sadia Mahmud [1] showed the prevalence of 10% of leather workers with respiratory morbidities. The reduced usage or not using glove while handling leather products can also provoke respiratory illness. Since skin exposures to chemicals have been shown to pay a major role in initial immunology sensitization, it is a very important link in casual chain for Asthma. Along with the exposure their personal habits like smoking can also aggravate the respiratory illnesses. The exposure to chromium can cause chronic ulcer in the nasal septum resulting in erosion of nasal septum. The ingestion of chemicals can cause ulcer in the gastrointestinal tract. In a study conducted at Kanpur by Subodh Kumar Rastogi [2] and others, revealed that 3.5% workers reported nasal mucosal congestion. The dermatological illness which includes itching, burning sensation, rashes, papules, over the body in various parts of the skin is estimated to be having a prevalence of 9% among leather workers in Kanpur study by Subodh Kumar Rastogi, Amit Pandey and Sachin Tripathi[2]. There is a specific lesion called chrome ulcer which is common among workers exposed or using chromium or in contact with chromium for long duration. Due to continuous stress and exposure to the environmental hazards the ocular illness is also noted among the leather workers, conjunctivitis, blurred vision, irritation are common in workers. The long duration of work and stress at work have effect on increasing the heart rate and stroke volume. The drastic changes are noted in systolic pressure and pulse pressure with increase in workload. The effect on central nervous system among the workers is not most common. Hexane, a saturated aliphatic hydrocarbon which is used as solvents for the production of leather footwear or as an adhesive shows a form of classic paralysis involving localizing involvements of limbs, a condition known as shoe maker's disease. The earlier mentioned study conducted at Kanpur among the leather workers showed the excretion of chemicals mainly chromium through urine causing carcinomatous changes in the uro-genital tract. A study among Swedish Leather tannery workers by Z. Mikoczy and L. Hagmar [3] showed cancer incidence, prostate cancer is also a common disease noted. Among all these illnesses the most common disorder is musculo skeletal disorder. The study conducted at Kanpur by R. Ory [4] revealed that musculo skeletal disorder occupies the major part in the morbidity pattern. The study shows nearly 60% of workers affected with musculo-skeletal disorders. The reasons are long duration of work, their working posture, lifting heavy objects results in frequent lower back pain, shoulder pain, leg pain etc., Among all the industrial workers, leather industry workers show musculo-skeletal disorder of 41.4% in male, 47% in female.

The objectives of this study are to find out various morbidity patterns among the workers in leather industry and to assess the association between various factors and various health problems.

MATERIAL AND METHODS

This is a descriptive study with one time interview of leather industry workers (tanning or dyeing). The workers from eight leather industries were selected after obtaining permission from Pallavaram Tannery Association. The data collection was carried out from August 16th, 2011 to till March 20th, 2012.

There are nearly 160 leather industries which come under Pallavaram Tannery association and in that around 62 factories are located near Sripuram and Nagalkenni area which comes under Rural Health Centre of Sree Balaji Medical College. All these industries are strict in allowing others to interview and conducting studies on health of workers. It is a must to obtain permission from Pallavaram Tannery Association.

Reasons of selecting and studying leather workers at their workplace:

- The workers in Sripuram and Nagalkenni area visit regularly to our rural health centre regarding their illness. They come for various illnesses like respiratory illness, fever, musculo-skeletal disorders etc.
- It is not possible for the workers to come out during their working time and the workers might be tired. Hence they might not come for interview after their working time.
- Interviewing the workers in their industries can help in assessing their work environment.

Sample Size

The sample size of single proportion can be calculated by

$$n = \frac{Z_\alpha{}^2 (PQ)}{d^2}$$

Where in the above formula,

n   :   is the sample size.
Zα   :   Z Value for level of significance
P   :   is proportion
Q   :   1 – P
d   :   is the difference (precision)

Here   Zα = 1.96   for 5% level of significance (two sided)
                P = 50% (Failure rate)
                Q = 100 – 50 = 50%
                d = 20% of P = 10%.

By substituting these values in the above formula, the required sample size will be

n = 96 ≈ 100.

The prevalence is considered as 50% as it will give the maximum sample size. As there are 48 leather industries in the survey area each industry is considered as a cluster and cluster sampling survey methodology is used to collect the data. Because of cluster sampling a design effect of 2 is considered. Therefore, the required sample size will be 2 x 100 = 200. To achieve the required sample size of 200, a random sample of 8 leather industries were selected and all the employees from these industries are surveyed. Thus the total sample size becomes 230. Pretested semi structured questionnaires was used. Questionnaires are translated to Tamil/English. All the questions in the questionnaire and the need of our study have also been explained to the workers and informed consent has been obtained. Socio-demographic profile, Health complaints, General and Physical examination for various health problems were asked and examined.

Data Analysis

The data collected were entered in 2009 Microsoft excel sheet. The SPSS (Statistical Package for the Social Sciences) version 15 was used for analyzing the collected data. The association between certain factors from socio-demographic profile with morbidities among the health workers were also assessed using Chi-square and Odd's ratio.

RESULTS

Workers who are working in eight leather factories from August 15th 2011 to March 20th 2012 were included in the study. All workers consent to participate in the study and hence two hundred and thirty labors were interviewed for the study. All the workers data were collected from all 230 workers are compiled and analyzed. Table I shows background characteristics of workers.

Table I: Background characteristics

S. no	Particulars	Frequency	Percentage
1.	**Age (in years)**		
	18-30	115	50
	31-40	92	40
	41-50	23	10
	51 and above	0	0
2.	**Gender**		
	Male	165	71.7
	Female	65	28.3
3.	**Marital status**		
	Married	179	77.8
	Single	51	22.2
4.	**Occupation**		
	Tanning	120	52.2
	Dyeing	110	47.8
5.	**Educational status**		
	Illiterate	169	73.5
	Primary	52	22.6
	Middle school	9	3.9
	Higher secondary	0	0
	Graduate/post graduate	0	0
6.	**Nourishment**		
	Ill nourished	138	60
	Normal	92	40
7.	**Smoking**		
	Present	127	55.2
	Absent	103	44.8
8.	**Alcoholism**		
	Present	128	55.7
	Absent	102	44.3
9.	**Past history of medical illness**		
	Present	63	27.4
	Absent	167	72.6

Overall Health status

Table II: Prevalence of health problems

S. No.	Problem	Frequency	Percentage	95%CI
1.	Eye problem	15	6.5	3.3 to 9.7
2.	Ear problem	1	0.4	-0.4 to 1.2
3.	Cardiovascular problem	2	0.9	-0.3 to 2.1
4.	Respiratory system problem	39	16.9	12.1 to 21.7
5.	Gastrointestinal problem	6	2.6	0.5 to 4.6
6.	Cerebrovascular problem	1	0.4	-0.4 to 1.2
7.	Musculo-skeletal problem	73	31.7	25.7 to 37.7
8.	Dental problem	6	2.6	0.5 to 4.6
9.	Dermatological problem	36	15.7	11 to 20.4
10.	Urogenital problem	1	0.4	-0.4 to 1.2

Table II shows among 230 leather factory workers, 78% of the leather factory workers were found to be suffering from one or more diseases, whereas it was 28.17% in a study conducted at Kanpur [5] and 40.1% in another study conducted at Kanpur [2]. Among the affected workers, occurrence of Musculo-skeletal disorder was the highest with 32%. Other major occurrences of disorders are Respiratory disorder with 17%, Skin disease with 16%, and Eye disorder with 7%.

Association of certain risk factors with medical morbidities

Table III shows association between certain factors like Gender (p value <0.0001), Occupation (p value-0.001), Nourishment (p value - <0.0001), past history of illness (p value<0.0001) with the morbidities among the leather workers that is statistically significant.

Table III: Association of certain risk factors with medical morbidities

S. No	Factor	N	Any one problem Frequency	%	Chi	OR	95%CI	p value
1.	Age (in years)							
	>35	67	57	85.1				
	<35	163	124	76.1	2.3	1.8	0.8 to 3.8	0.13
2.	Gender							
	Female	65	63	96.9				
	Male	165	118	71.5	17.9	12.5	2.9 to 53.7	<0.0001
3.	Occupation							
	Tanning	120	105	87.5				
	Dyeing	110	76	69.1	11.6	3.1	1.6 to 6.2	0.001
4.	Marital status							
	Married	179	138	77.1				
	Single	51	43	84.3	1.2	0.6	0.3 to 1.4	0.267
5.	Nourishment							
	Ill nourished	138	127	92.0				
6.	Educational status							
	Illiterate	169	131	77.5				
	Literate	61	50	82.0	0.5	0.7	0.3 to 1.6	0.467
7.	Past history of medical illness							
	Present	63	63	100				
	absent	167	118	70.7	23.5	1.4	1.3 to 1.6	<0.0001
8.	Substance abuse							
	Present	149	116	77.9				
	Absent	81	65	80.2	0.179	0.8	0.4 to 1.7	0.672

Legend: N implies Sample size for the corresponding grouped factors; OR implies Odd's Ratio;

DISCUSSION

From the above results, the socio demographic data and its association with morbidity pattern were assessed.

Socio Demographic Characteristics

Age distribution:

The mean age of the subjects is 32; this is compared to the study at Kanpur [6].

Gender distribution:

In the present study, 71.7% of the workers were male and 28.3% were female. In other studies it shows that 30% of women predominance [6].

Income:

In our studies average income is found to be 3700 INR whereas in other studies it was 546 INR [7] and 4000 INR [8].

Marital status:

It was found that around 77.8% of the workers considered for this study were married whereas in other studies it was 67.4% married and staying with their families [6].

Education:

In our study 73.5% of the workers are illiterate and VI standard is the highest literacy level whereas in other studies it was 59.8% illiterate[5] and 41% illiterate [8].

Ocular disorder:

In our study 6.5% of the leather factory workers suffering from ocular disorder, whereas in other studies it was 14.7% in study conducted at Kanpur [2] and 3% [5].

Respiratory disorder:

In our study 16.9% of the leather factory workers were suffering from Respiratory Disorder, whereas it was 10.8% in study at Karachi [9], 16.7% in a study at Kanpur [10] and 40% in study at Kanpur [5].

Skin disorders:

In our study 15.7% of the leather factory workers were suffering from Skin Disorder, whereas it was 23% in study conducted at Kanpur [5].

Musculoskeletal disorder:

In this study, it was found that 31.7% of the leather factory workers were suffering from Musculo-skeletal Disorder. Whereas in other studies they have considered only lower backache. In this study, it was found that Lower backache is about 8%, whereas it was 61% in study conducted at Kanpur [11] and 24.9% in study at Taiwan [12].
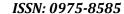
Association of certain risk factors with medical morbidities:

From the above result, there is association between certain factors like Gender, Occupation, Nourishment, past history of illness with the morbidities among the leather workers and it is also statistically significant. Since there is an association identified based on the above study, there is an impact of type of occupation, past history of medical illness and gender difference over morbidity pattern among workers. There is no impact of age, marital status and educational status over morbidity pattern.

CONCLUSION

The results of the study showed that there is a need to improve the health status and health needs of the workers in the leather industries. Protective measures should also be provided to reduce the various morbidities. Health status of the workers is more important for economic production of the factory and also in developing good socio economic status for their family. There are various factors influencing the health status of the workers. It is necessary for the health care provider to identify such factors, thus the monitoring and care provided can be improved.

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