International Journal of Community Medicine and Public Health
Bose AK et al. Int J Community Med Public Health. 2019 May;6(5):2246-2251
http://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: http://dx.doi.org/10.18203/2394-6040.ijcmph20191852

Original Research Article

An epidemiological study to evaluate morbidity patterns among wood workers belonging to unorganized sector

Aritra K. Bose, Dilip D. Kadam*, Anusha C. P.

Department of Community Medicine, Seth G.S. Medical College, Mumbai, Maharashtra, India

Received: 08 March 2019
Revised: 17 April 2019
Accepted: 18 April 2019

***Correspondence:**
Dr. Dilip D. Kadam,
E-mail: aritra3451@gmail.com

ABSTRACT

Background: Wood workers are predisposed to many occupational diseases. Studying work place environment and its association with the morbidities would provide practical insights to promote the health and prevent disease in wood workers. Present study intends to study the epidemiological determinants of health and morbidity in wood workers.
Methods: Quantitative method of research is used. All One hundred and five wood workers in the study area were recruited after taking informed consent. A semi-structured, pre-validated, questionnaire consisting of questions on sociodemographic profile, working pattern, morbidities experienced and working environment was prepared. Data was collected using one to one interview at their workplace. Environmental factors like iIllumination (In LUX) and noise level (in db) at the work place was measured using a Lux meter and sound level meter respectively. Association between different variables were analysed using Chi-square test or t-test wherever applicable.
Results: Participants were all male belonging to economically productive age group. They were predominantly Muslims, belonging to lower socioeconomic status. Morbidities experienced by the wood workers were musculoskeletal pain (52%), skin problems (57%), eye problems (57.14%) and ear problems (32.38%). Inadequate illumination (<100 LUX) and noise levels more than 90 db were significantly associated with increased accidents and ear morbidities respectively.
Conclusions: Poor working environment and non-compliance with the working standards prescribed by ILO (Indian Labour Organisation) are associated with morbidities among the workers. Environmental modification, use of protective devices, availability of basic minimum facilities for working and continuous monitoring of the workplaces by competent authority would help in decreasing the prevalence of morbidities among woodworkers.

Keywords: Wood, Dust, Unorganised sector, Occupational exposure

INTRODUCTION

Occupational health is a branch of medicine aimed at enhancement of physical, mental and social well-being of workers and provide support for development and maintenance of their working capacity as well as professional and social development at work.[1] In the past, it was customary to think of occupational health entirely in relation to factories and mines. Gradually it has developed from a mono disciplinary risk oriented activity to a multi-disciplinary comprehensive approach embracing all types of employment including mercantile, commercial enterprise, service trades, agriculture and forestry.

Wood has been used since ages for many purposes, primarily as a fuel or as a construction material in almost all countries because of its high tensile strength and

durability. But the processing of wood into usable articles often predisposes the workers involved in it, to a myriad of occupational morbidities like pneumoconiosis, deafness, injuries, urticaria etc. Studies have shown that at least 2 million people are exposed to wood dusts related diseases around the world.[2]

With industrialization and electrification now wood workers mostly use high speed electricity driven instruments for processing of wood. Although these instruments have helped in reduction of processing time and physical labour, a moment's loss of precision while using them can cause grievous injuries leading to loss of daily wages or disability. Also majority of the wood workers do not receive adequate preplacement training which further increases the risk of injury. In a study it was estimated that 11.2 DALY's per year are lost due to injuries.[3]

Association between working environment & musculoskeletal symptoms has been widely reported among wood workers. Wood particles are detrimental to eyes as well, causing chronic ocular irritation. [4] Morbidities of eyes are further aggravated by poor illumination at workplace and lack of preplacement training. Noise is among the most ubiquitous of hazardous occupational exposures. In a typical wood industry decibel levels often exceed industry limits (85db) which on prolonged exposure may cause noise induced hearing loss, irritability, dullness etc.[5] Also working with automatic tools like chain saws, pneumatic chisels and orbital sanders exposes the workers to the risk of vibration disease and white fingers due to circulatory changes precipitated by continuous vibration.

The enumerated hazards are more severe in small and medium enterprises especially in the unorganised sector where either the attention to labour safety is much down the priority list or the workers involved are often uneducated and unaware of the importance of the personal protective / safety equipment's (PPEs). [6,7] Woodworkers especially from the unorganised sector and freelancers are also vulnerable to high job mobility as they keep changing jobs frequently because of poor employee-employer relationship & in a desire to get better earnings. In addition the monotony at work and the frustration of not achieving a decent standard of living lead to different forms of addictions like tobacco, alcohol and drug abuse contributing to further morbidity.

Although studies have been conducted internationally on carpenters, there are very few studies available from this country. Studies have been conducted to find out the morbidities amongst sawmill workers but there are very few studies which have probed into morbidity patterns among the wood workers from unorganised sector in India. In this study we tried to study the health hazards faced by wood workers in unorganised sectors. Additionally the work place environment and its association with the morbidities were also studied. The study would provide practical insights in planning health promotion and disease prevention strategies for wood workers.

Objectives

- To study socio-demographic profile of wood workers.
- To study the epidemiological determinants influencing the health status and morbidity profile of wood workers.
- To recommend appropriate health promotional measures based on the study findings.

METHODS

The study was conducted in the field practice area of urban health centre of Seth G.S. Medical College situated in Mumbai. Approval for conduction of study was obtained from the Institutional Ethics Committee. On the basis of an enquiry made from the wood workers who visited the urban health centre and based on a survey conducted in the area all wood workers in the area were enumerated and the number of workers came to be 108. Three worker did not give consent to participate in the study so the final sample size came out to be 105. There were a total of 35 establishments in which they were working. The study was conducted over a period of 6 months that is from June 2018 to November 2018.

A semi-structured, prevalidated questionnaire was prepared in accordance with the objectives of the study. Every wood worker in the study area was visited individually. Informal discussion was done with them in order to build rapport. The purpose of the study was explained using informed consent document and such consent was obtained from each of the study subjects in Hindi. A time schedule for the interview was prepared in consultation with the wood workers giving due consideration to the feasibility of their working hours and availability of the worker. One to one interview method was used to interview the wood workers after taking consent and the data was collected with the help of a pre validated questionnaire. Respondents were also asked about pre-employment training and use of personal protective equipment's.

Following parameters were used to study the working environment:-

- Illumination (in LUX) at their work place was measured using a Lux meter.
- Noise level (in db) was assessed using a sound meter.

This was followed by systemic examination which included examination of pulse, blood pressure (sitting position) and auscultation of cardiovascular and respiratory system and per abdominal examination. Confidentiality of the study subjects was maintained. Any wood workers who were identified as having morbid

conditions were referred to an appropriate health facility with a referral note. Statistical analysis of the data was done using SPSS version 22. Association between different variables were analysed using Chi-square test wherever applicable.

RESULTS

The study subjects were males belonging to the economically productive age group (n=33.13 years). They were hailing from states of Uttar Pradesh (26.7%), Bihar (15.2%) and Maharashtra (39%). Almost half of the study subjects were educated, 32.4% had studied till primary school and 34.3% till secondary school. The workers were predominantly Muslims belonging to lower socioeconomic class (52.4%).

Table 1: The job profile of the study subjects was varied.

Type of job	No. of study subjects (n)	Percentage (%)
Cutter	34	32.4
Polisher	20	19
Helper	18	17.1
Freelancer	15	14.3
Design makers	11	10.5
Owner	7	6.7
Total	105	100

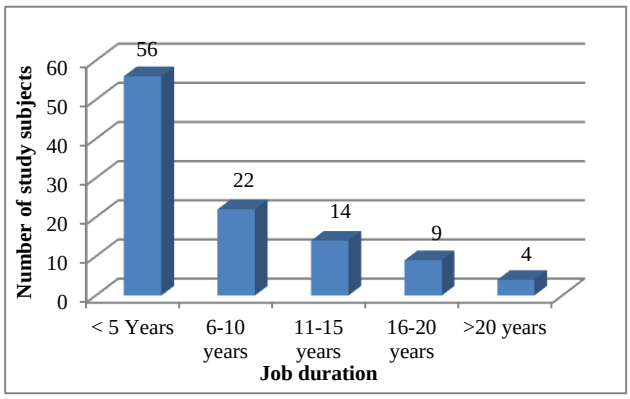

Figure 1: Distribution of study subjects according to duration of job.

It was observed that majority of the wood workers i.e. 56 (53.3%) were working in this field for less than 5 years (Figure 1).

The study found 32 (30.5%) of them were working for 8 hours per day, 66 (62.9%) were working 8-10 hours per day and 7 (6.7%) worked for 10-12 hours per day. 42 (40%) wood workers were not allowed any breaks between work while 45 (42.9%) didn't get weekly offs. 48 (45.7%) were using both electric and manually operated instruments while 44(41.9%) were using hand driven instruments and 13 (12.4%) were using only electrically driven instruments. 67 (63.08%) of the workers had some form of addiction which include alcohol, cigarate, tobacco chewing etc.

The wood workers having no morbidities were classified as healthy (43.8%) and workers having any morbidity or any abnormal finding in systemic examination were labelled unhealthy (56.2%). The morbidities that they suffered are enumerated in Table 2.

Table 2: Morbidity profile of the study subjects. (*multiple responses).

Morbidities*		Frequency*	%
Musculoskeletal pain		55	52.4
Eye morbidity	Redness	19	18.1
	Watering	18	17.1
	Pain	5	4.8
	Change in spectacles (recurrent)	18	17.1
Ear morbidity	Tinnitus	9	8.6
	Vertigo	5	4.8
	Decreased hearing	20	19.0
Skin morbidity	Redness	6	5.7
	Eruption	18	17.1
	Urticaria	36	34.3
Nasal morbidity	Stuffiness	27	25.7
	Running nose	17	16.2
	Recurrent sneezing	16	15.2

*Multiple responses given.

It was found that amongst the wood workers who experienced musculoskeletal pain, 35 (64%) of them did not experience any symptoms during off days and 10 (18%) experienced decreased symptoms during off days. Only 16.3% sought medical help for pain relief while others used modalities like self-medication, local massage and tobacco chewing to get relief from pain.

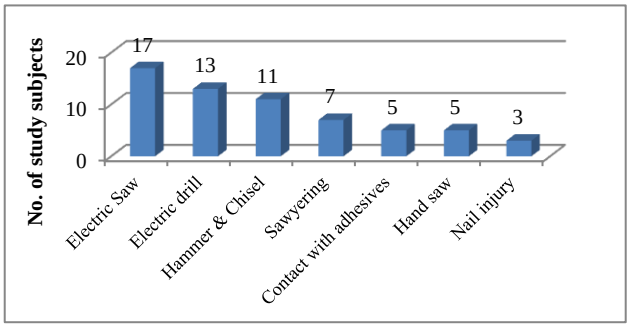

Figure 2: Distribution of cause of injury among wood workers.

On enquiring about their skills it's was found that none of the wood workers had received any pre placement

training. 61 (58.1%) wood workers reported getting injured while at work in last one year, majority i.e. 39 (37.1%) reported injuries inflicted upon upper limb followed by 9 (8.6%) in the lower limb. Injuries were common while working with electricity operated instruments (Figure 2).

Table 3: Association between risk factors and morbidities.

Variable	N (%)	N (%)	X^2, DF	P value*
Injury or accidents at work place	**Yes**	**No**		
Duration of work/day >8 hours	47 (64.38)	26 (35.61)	3.091, 1	0.049
Inadequate Illumination at work place (<750 Lumen)	44 (74.58)	15 (25.42)	15.026, 1	0.02
Musculoskeletal pain	**Present**	**Absent**		
No break taken in between work	27 (64.28)	15 (35.71)	2.971, 1	0.046
Ear morbidity	**Present**	**Absent**		
Noise at Work place (>90 db)	17 (42.5)	23 (57.5)	4.409, 1	0.036
Tenure of Job >5 years	18 (40.91)	26 (59.01)	3.891, 1	0.04
Allergic symptoms	**Yes**	**No**		
Irregular Floor cleaning	34 (52.3)	31 (47.69)	4.312, 1	0.04
Health status	**Healthy**	**Unhealthy**		
Use of hand driven instrument	14 (26.92)	38 (73.08)	11.93, 1	0.0005
Addiction	24 (31.20)	53 (68.80)	18.74,1	0.002

Also the workers who were injured, only 6(9.8%) wood workers had received TT vaccination while 55(90.2%) didn't receive vaccination. 20% workers have suffered from diarrhoea, fever (12.38%), Upper respiratory tract infection (10.28%) and 6.67% of them have suffered from typhoid in last one year. It is observed 34% were seeking treatment from nearby Urban Health Centre or Municipal hospital whereas 66% visited private practitioner for their illnesses. 30% workers reported missing work 3 or more times in a year due to sickness but they did not receive any compensation for the same.

Working environment – study findings indicate that 40 (38.1%) workers were working in noisy environment with sound level more than 95db. 68(64.8%) of the work places had no ventilation while only 20% had cross and 15.2% had exhaust ventilation. Also most of the workers 59 (56.2%) were working in inadequate illumination (i.e. 150 LUX) required for wood work.[8] 54.3% work place floors were cleaned ones weekly and 7.6% work place floors were cleaned fortnightly. Cleaning of the floor was done by the wood workers themselves using non electrical hand held equipment's. Basic facilities such as toilet was absent in 60.9% workplaces, drinking water source was not present in 75.2% workplaces and 84.8% workers reported rodent infestation at their workplace.

The study findings indicate that incidence of injury (p=0.049) and musculoskeletal pain (p=0.034) was significantly associated with increased duration of work per day. Not taking break in between work was significantly associated with presence of musculoskeletal pain among workers (p=0.02). Exposure to noise of more than the prescribed limit of 85 dB for longer duration was significantly associated with ear morbidities among workers (p=0.04). Floor cleaning frequency was significantly associated with allergic symptoms (urticaria, rash and skin redness) among workers. The health status of the workers was found to be significantly associated with addiction (p=0.02) and use of hand driven tools (p=0.00).

DISCUSSION

The study findings indicate that the skills of wood craft in the Indian states of UP and Bihar dominate and most of the workers were migrants working on contract or as a freelancer. In an article by Singh DP it is said that migration from other states, mostly Uttar Pradesh and Bihar, has increased over the last two decades.[9] In an attempt to earn a decent standard of living the workers are forced to work 7days a week for 8-10hrs without taking any break which exceeds the working limits prescribed by factories act 1948.[10]Prolonged working hours without any break causes muscular fatigue which can be the cause of higher incidence of musculoskeletal pain and injuries among them. Similar results were reported by Oluwatosin et al in which 60% of the workers were working for 9-10 hours per day.[11] The study findings show predominant use of electricity driven tools by the works. Mechanical tools eject fine dust in the atmosphere which when coupled with poor working environment, lack of ventilation and irregular cleaning of floors can be the cause allergic reaction like urticaria, eye redness, burning etc. among the workers. In studies by J. Milena et al and Sakariya et al high incidence of allergic symptoms were reported among saw mill workers.[12,13] More than half of the workers were working under inadequate illumination recommended for wood work. Poor lighting conditions contribute to worsening eyesight of workers, eye strain and visual fatigue. Also poor illumination is associated with increased probability of occupational injuries. In our study workers reported more injuries inflicted in the upper limb which can be due to use of unstandardized machines without protective guards

and non-usage of personal protective devices by the workers. The study found 40% of the workers were exposed to noise more than the industry standards which can be causing ear morbidities among workers.[14] Majority of the workplaces lacked basic facilities like drinking water, toilets which can be the cause of infectious diseases and sickness absenteeism among the workers. The findings strongly indicate that the workers of the unorganized sectors have no set standard working conditions. Compelled by poverty they often continue work bearing all the difficulties which puts them in the vicious cycle of frustration, monotony of work leading to addiction which further leads to poor health status.

Recommendations

The employers must follow the minimum standards for wood working recommended by ILO and Factories Act 1948[10] and basic essential requirements like continuous supply of clean drinking water, toilet facility etc. must be provided in the workstations. These minimum necessities may be regularly monitored by shops and establishment department of Municipal Corporation. The wood workers should be encouraged to take frequent breaks in their daily work and duration of work per day should not exceed 8 hours. The electricity driven equipment liberating suspended particulate matter in the air must be covered and also provided with guards to reduce injuries. The urban health center may start an occupational health wing in collaboration with occupational health department. This liaison will benefit all workers from organized as well as unorganized sector in the nearby vicinity. Community based camp approach may be adapted by this center to provide comprehensive healthcare services to such workers so as to make them aware of the occupational hazards. The Prime Minister's health insurance scheme should be popularized among the wood workers so that they can avail health facilities in government hospitals at no cost. The workers may be linked to national skill development mission under the Ministry of Skill Development and Entrepreneurship for skill learning, upgradation which would result in economic benefits.

A total 105 wood workers from the field practice area of urban health center were included in the study. However, a larger sample would be required to generalize the study findings. Further cohort studies can be undertaken to establish causal relationship between risk factors and the morbidities enumerated in the study.

CONCLUSION

Poor working environment and non-compliance with the working standards prescribed by ILO is associated with work place morbidities in wood. Environmental modification, use of protective devices, availability of basic minimum facilities for working and continuous monitoring of the workplaces by competent authority would help in decreasing the prevalence of morbidities among woodworkers.

Present study is one of the firsts in India to study the work-related morbidities among wood workers in unorganised sector. Results from this study gave insights into the morbidities of the workers along with the factors associated with the same. It also pointed out that the problem is in the stage of implementation of standards. This calls for stringent monitoring and legislations to prevent bypassing the standards. The present study provided knowledge that helps in taking appropriate evidence-based actions to prevent the morbidities and promote health in wood workers.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee Seth G.S. Medical College & KEM Hospital

REFERENCES

1. Theorell T. Occupational Health. Int Encycl Soc Behav Sci Second Ed 2015:133–40.
2. Osman E, Pala K. Occupational exposure to wood dust and health effects on the respiratory system in a minor industrial estate in Bursa/Turkey. Int J Occup Med Environ Health 2009;22:43–50.
3. Payne SR, Waller JA, Skelly JM, Gamelli RL. Injuries during woodworking, home repairs, and construction. J Trauma 1990;30:276–80.
4. EA T, TF E, OH O, DA A. Occupational Exposure to Wood Dust and Respiratory Health Status of Sawmill Workers in South-South Nigeria. J Pollut Eff Control 2015;04:1–6.
5. Sbihi H, Teschke K, MacNab YC, Davies HW. Determinants of Use of Hearing Protection Devices in Canadian Lumber Mill Workers. Ann Occup Hyg 2009;54:319–28.
6. Odusanya OO, Babafemi JO. Patterns of delays amongst pulmonary tuberculosis patients in Lagos, Nigeria. BMC Public Health 2004;4:18.
7. Rogoziński T, Szwajkowska-Michałek L, Dolny S, Andrzejak R, Perkowski J. The evaluation of microfungal contamination of dust created during woodworking in furniture factories. Med Pr 2014;65:705–13.
8. Jerry Clere and Frank Hearl. NIOSH Method 0500: Particulates Not Otherwise Regulated, Total 1994:5–7.
9. Singh DP. Migration and occupation in Mumbai issues and implications. 2019.
10. Ministry of labour and employment. The Factories Act. Factories Act 1948.
11. Adeoye OA, Adeomi AA, Olugbenga-bello AI, Bamidele JO, Abodunrin OL, Sabageh OA. Respiratory symptoms and peak expiratory fl ow among sawmill workers in South Western Nigeria. J Environ Occup Sci 2014;3:141–3.
12. Gómez ME, Sanchez JF, Angélica M, Cardona JFP, Paula T, Deisy S, et al. Health and Working

Conditions in Carpenter's Workshops in Armenia (Colombia). Ind Health. 2010;48:222–30.
13. Sakariya K, Chavda B, Sorani A, Kakaiya M, Joshi V, Professor A. A study on dynamic lung volumes of sawmill workers In Jamnagar City. Int J Basic Appl Physiol IJBAP. 2014;3:1.
14. Ali BO. Fundamental principal of occupational health and safety. 2007;136:46-52.

Cite this article as: Bose AK, Kadam DD, Anusha C. P. An epidemiological study to evaluate morbidity patterns among wood workers belonging to unorganized sector. Int J Community Med Public Health 2019;6:2246-51.