



Respiratory symptoms in workers at Katako wood market, Jos, Plateau State, Nigeria

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KEY WORDS:

Timber workers
Respiratory Symptoms
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Abstract

Background: Exposure to wood dust has been shown to cause organic dust toxic syndrome, occupational asthma, airway inflammation, an increased risk of sinusoidal cancer and impaired lung functions in woodworkers. This study determines the prevalence of respiratory symptoms and the lung functions of woodworkers in Jos, north-central, Nigeria.

Materials and Methods: A cross-sectional study design was used to interview 120 timber workers from a timber market sampled using simple random sampling. Information was obtained using interviewer-administered questionnaires and the lung function tests of the participants measured using a peak flow meter.

Results: The mean age of the respondents was 28 years. At the time of the study 62.5% (75) of the respondents had respiratory symptoms; many had more than one symptom. The main symptoms among the respondents were regular blocked nose in 74(61.71%), runny nose 50(41.7%) recurrent cold 27 (22.5%), sneezing 68(56.7%), noisy breathing 11 (9.2%), shortness of breath 8(6.7%), chest tightness 16(13.3%) and cough 63(52.5%). All the workers with symptoms experienced them at work while, 56(74.6%) had relief when away from work. The symptoms were mainly associated with Mahogany, Masonia, Bosca and Obeche (African whitewood) woods. None of the workers in the mill were observed to be using respirators or masks. Only one (0.8%) of the workers had peak expiratory flow volume (PEFV) less than 300 liters /minute. The peak expiratory value had no significant association with the presence of symptoms and the number of years spent working in the wood industry (p= 0.454).

Conclusion: Wood workers should be health educated on the dangers of wood dust; they should be encouraged to use masks and wood dust should be controlled at source.

Introduction

It is widely known that repeated and long-term exposure to certain irritants in the work place can lead to an array of lung diseases that may have lasting effects even after exposure ceases. The wood industry (both sawmills and furniture industry) is one of the occupations where exposure to wood dust has been shown to lead to a lifetime of lung problems long after exposure has ceased.¹

Wood dust is classified as organic dust. Like other organic dusts, it may contain bacteria and fungi that can be potentially pathogenic. Wood dust is also classified as a human carcinogen.² Exposure to wood dust can lead to organic dust toxic syndrome, occupational asthma, airway inflammation and an increased risk of sinusoidal cancers presenting with

a range of respiratory symptoms.^{3, 4,5,6,7, 8} Several studies have shown that there is a significant relationship between wood dust exposure and impaired pulmonary function of the restrictive type.^{5, 6, 7, 9 10}

In Nigeria, the wood industry is a viable one. wood is used for furniture, building and other construction works etc. The processes involved in the average sawmill in Nigeria includes stacking, planking, grading and sawing of wood. Both soft and hard woods are used in the wood industries. Because of high rates of poverty, and illiteracy the use of protective masks are limited.. This is worsened by the fact that oftentimes very few persons are under the employment of timber merchants, making it very difficult to classify the workplaces as industries and thus apply and enforce labour rules, This study was carried out to determine the prevalence of respiratory symptoms and lung functions amongst workers at the Katako wood market, Jos.

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Materials and methods

Katako wood market is in Jos metropolitan area of Plateau state. It is the centre of woodwork activity in Jos. The market consists of 36 independent marketers who process the wood individually. Together they employ a total of 350 workers. The wood is usually transported to the market from the logging sites in the forests. People from different parts of the city and from outside the city patronize the market. Work hours in the market are between 7:00 A. M. to 6:00 P. M. Mondays to Saturdays and the workers are usually engaged in processing, cutting and selling of wood. All the workers work outdoors under shades. The study was carried out in October, when the weather is warm and respiratory infections not as prevalent as in the colder months.

The minimum sample size was determined using the formula for cross-sectional descriptive studies using a p value of 4.1% from a similar study in Indonesia.⁹ The sample size obtained was doubled to 120 to increase precision.

From a listing of all the regular workers of the market, obtained from the office of the union of wood sellers located in the market, the sample of 120 was drawn using simple random sampling method with the aid of table of random numbers.

After informed consent was obtained from the participants, an interviewer-administered questionnaire was administered to them. Information sought included socio-demographic data, work history and history of respiratory symptoms. A lung function test was also carried out on each participant using a peak flow meter. A peak flow meter is a hand-held device that somebody can blow into to get a reading of how rapidly one can blow out - known as the Peak Expiratory Flow Volume Rate (PEFV) or forced exhalation. It is very useful for getting an objective measure of the condition of the lungs and airway. The PEFV in healthy adult males depending on their age and size is in the range of 350 to 700 litres per minute, in females the range is 300 to 700 litres / minute.¹¹

Results

One hundred and twenty workers were interviewed, of these 117 (97.5%) were males and 3(2.5%) were females. The mean age was 28 years, ranging from 20 to 56 years. Fifty five (45.8%) of the study population saw wood, 49 (40.8%) sell wood and 16(13.3%) carry wood (labourers). The mean number of years on the present task was 4 years. One hundred and seventeen (97.5%) of the study population work 6 – 7 days/week and 96.7% of the workers spent

greater than 8 hours per day. Thirty seven (31.4%) were current smokers and they all smoke cigarettes.

At the time of the study 75 workers (62.5%) had respiratory symptoms; many workers had more than one symptom. Seventy four (61.71%) of the total population studied had regular blocked nose, 50(41.7%) had runny nose and 27 (22.5%) had recurrent cold. Sixty eight (56.7%) of the study population had sneezing, 11 (9.2%) had noisy breathing 8(6.7%) had shortness of breath, 16(13.3%) had chest tightness, 63(52.5%) had cough (Table 1). All the workers with symptoms experienced them at work while 56(74.6%) of those with symptoms had a relief or symptoms disappeared during weekends or when they were away from work. None of the workers in the mill was observed to be using respirators or masks.

Table 1: Distribution of respiratory symptoms in worker in Katako wood market

symptoms	frequency	%
Regular blocked nose	74	61.71
Recurrent cold	27	22.5
Sneezing	68	56.7
Noisy breathing	11	9.2
Runny nose	50	41.7
Shortness of breath	8	6.7
Tightness of chest	16	13.3
Cough	63	52.5

More workers sawing wood had respiratory symptoms but the finding was not statistically significant as no statistically significant relationship was found between all the respiratory symptoms and the specific tasks performed by the participants of the study (Table 2).

The relationship between prevalence of the respiratory symptoms of regular blocked nose sneezing, cough, noisy breathing and recurrent cough and the duration of years spent working in the wood industry were not statistically significant. However tightness of the chest, cough and shortness of breath were statistically significant ($p=0.02$, 0.03 and 0.01 respectively).

Only one (0.8%) of the workers had PEFV of less than 300 litres /minute, 5 (4.2%) had PEFV of greater than 600 litres /minute, 23 (19.2%) had PEFV of between 300-400 litres/minute, 51 (42.5%) had PEFV of between 500-600 litres/minute. (Table 4).

Table 2: The relationship between specific tasks performed and presence of respiratory symptoms

Symptoms	Carrying of wood		Sawing of wood		Selling of wood		X ²	df	P
	Freq	%	Freq	%	Freq	%			
Regular blocked nose	7	9.5	37	50	30	40.5	2.908	2	0.172
Recurrent cold	4	14.8	9	33.3	14	51.9	2.281	2	0.789
Sneezing	9	13.2	35	51.5	24	35.3	2.268	2	0.086
Noisy breathing	0	0	6	54.6	5	45.5	2.173	2	0.551
Runny nose	8	16.0	23	46	19	38	0.626	2	0.248
Shortness of breath	0	0	6	75	2	25	3.260	2	0.324
Tightness of chest	1	6.3	8	50	7	43.7	0.803	2	0.635
Cough	8	12.7	28	44.4	27	42.9	0.229	2	0.635

Table 3: Relationship between duration spent in wood industry and presence of symptoms

Symptoms	Number of Years								X ²	df	P
	1-3		3-5		<1		>5				
	F	%	F	%	F	%	F	%			
Regular blocked nose	20	27	19	25.7	1	1.4	34	45.9	3.396	3	0.334
Recurrent cold	4	14.8	10	37	0	0	13	48.1	7.646	3	0.392
Sneezing	19	27.9	16	23.5	3	4.4	30	44.1	2.998	3	0.054
Noisy breathing	1	9.1	3	27.3	1	54.5	6	54.5	4.382	3	0.827
Runny nose	14	28	10	20	1	50	25	50	0.895	3	0.223
Shortness of breath	0	0	0	0	1	87.5	7	87.5	11.369	3	0.01
Tightness of chest	1	6.3	2	12.5	1	75	12	75	9.065	3	0.028
Cough	17	27	13	20.6	3	47.6	30	47.6	3.619	3	0.030

Discussion

In this study, slightly less than two-third of the wood workers had respiratory symptoms and the prevalence of the specific respiratory symptoms were: regular blocked nose 74 (61.71%), recurrent cold 27(22.5%), sneezing 68(56.7%), noisy breathing 11(9.2%), runny nose 50(41.7%), shortness of breath 8(6.7%), tightness of chest, 16(13.3%), cough 63(52.5%). Studies elsewhere in the world reported similar symptoms in woodworkers.^{7, 12, 13} However other symptoms were also reported outside the respiratory system, these included frequent headaches and eye irritation problems.^{7, 12, 13} The frequent headaches may have resulted from inflammation of the upper respiratory tract. No statistically significant relationship was found between respiratory symptoms and the type of task carried out by the workers. However it was observed that persons with more exposure to wood dust had a higher frequency of respiratory symptoms. Other studies, however, showed a statistically significant relationship between respiratory symptoms and the kind of tasks

performed.^{9, 12, 14, 15} The difference between this finding and other studies could be as a result of the fact that those studies had a larger sample size and the fact that the milling processes were done indoors. Persons who had worked in the wood mill for more than 5 years were more likely to experience symptoms ($p=0.037$). This may suggest a dose-response relationship. A lot of the workers with respiratory symptoms identified particular types of wood which precipitated these symptoms. These woods were Mahogany, Obeche (African white wood), Masonia and Bosca. Other studies also found that Obeche (African white wood) woods were associated with allergic respiratory symptoms.¹⁶

The peak respiratory flow rate value was normal for 99.2% of the workers (>300litres/minute). Only 1(0.8%) of the workers had an abnormal PEFV (<300litre/minute). Perhaps if other more standard equipment for measuring or assessing respiratory function (airway resistance) were used like the spirometry, chest x-ray, more people with reduced lung function would have been detected.

The peak expiratory value had no significant association with the presence of symptoms and the number of years spent working in the wood industry ($p= 0.454$). The peak expiratory value had no significant association with the specific task performed in the wood industry ($P= 0.344$).

This study has shown that respiratory symptoms form a major work-related health problem being encountered by wood workers in Katako wood market. These symptoms appear to be work related and have a dose-response relationship. More so the symptoms were mainly associated with the red woods namely Mahogany, Masonia, Bosca and Obeche.

Table 4: The distribution of the peak expiratory flow rate values (PEFV) of the workers

PEFV(litres/ minute)	frequency	%
> 300	1	0.8
300-400	23	19.2
400-500	55	45.8
500-600	36	30.0
< 600	5	4.2
Total	120	100

However, this study did not establish any significant association between the peak expiratory flow rate values and the number of years spent in wood industry as well as the specific task performed in the wood industry. This study also did not establish any significant association between specific tasks performed with presence of respiratory symptoms.

Based on the findings from the study, it is advised that awareness of the dangers of wood dust exposure amongst wood workers should be increased and wood workers encouraged to use respirators or masks when likely to be exposed to wood dust. More so, wood dust should be controlled at the source.

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